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Agriculture-Based Economic Development:

Trends and Prospects for New York

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PREFACE

Structural change in New York agriculture continues to raise new questions about the industry and its future prospects for economic growth and development. What steps can educators, community leaders, and public agencies take to promote improvements in the economic and social climate for communities that are dependent upon farm and food production? The New York State Department of Agriculture and Markets and Cornell's College of Agriculture and Life Sciences play an important leadership role in the agriculture-based economic arena. This report is one of two documents that deals with the collaborative work that will be needed to advance the discussion of development challenges and opportunities for the State and identifies program milestones for the Commissioner. A second report, entitled *Market Enhancement Programs Operated in New York's Key Competitor States and Provinces*, documents the direction and scope of well over 100 ag-based economic development programs now operating in competitor states and Canadian provinces.

This research effort was conducted with financial support provided by the New York State Department of Agriculture and Markets. The Commissioner and his staff were directly involved in the study design and provided periodic advice on its conduct. In addition, the study was supervised by an advisory committee assembled by the Commissioner. The advisory committee membership included: Pat Hooker, NYS Farm Bureau; Tom Shepard, Dairylea Cooperative, Inc.; Joe Walsh, Cornell Cooperative Extension, Sullivan County, New York; Tim Pezzolesi, Cornell Cooperative Extension, Ontario County, New York; Martin Culik, Cornell Cooperative Extension, Genesee County, New York; R. David Smith, Cornell University; John Mitchell, IL Richer Feeds, Inc.; Ora Rothfuss, Ag Development Specialist, Wayne County Planning, Wayne County, New York. In addition, Michael Chamberlain, formerly with NYS AgriDevelopment Corp., made important contributions to the design and conduct of the study.

Agriculture-Based Economic Development: Trends and Prospects for New York

Executive Summary

Policymakers in New York State are confronted with a set of fundamental questions about agriculture-based economic development. The purpose of this report is to help advance the discussion of agricultural development challenges and opportunities for the State and identify program milestones for the Commissioner of Agriculture and Markets. Specific objectives were to assemble baseline information on farm and food trends and develop new estimates of interindustry relationships and economic multipliers for New York farm and food sectors. A companion report contains an inventory of agriculturally-based economic development of programs in New York's key competitor states and two Canadian provinces.

Addressing these topics requires a full understanding of concepts and definitions. Changes in the structure of farm and food production and differences in the language and terminology used by data providers made this step essential.

- To take the wide view and to recognize new forms of business, agricultural economic development should take the entire "food system" into account. This approach directs attention to economic activities ranging from behind-the-farm-gate food and fiber production to final food and fiber consumption and the steps in-between.

- Many farm and food business firms are seeking opportunities to diversify and grow their businesses. Following business growth and diversification strategies can make relatively simple businesses into multiproduct firms that combine commodity production with downstream provision of services, processing, and/or distribution to consumers.

- Along with diversified business forms, some new or just-emerging products will also test the meaning of farm and food production or blur any neat lines between commodity production, services, and manufacturing.

- Federal statistics count farms as places producing farm commodities having a market value of $1,000 or more per year. The 1997 Census reported that New York has about 32,000 farms. The Census also reported that New York has approximately 7.2 million acres of land in farms.

- The five-year Census routinely undercounts farms and subsequently underestimates the acreage of land in farms. Undercounts are evidenced in annual estimates of farms and land in farms made by the New York Agricultural Statistics Service. In 1997, the Service estimated farm numbers at 38,000 and land in farms at 7.8 million acres.

- A different impression of farmland area comes from the U.S. Department of Agriculture's National Resources Inventory (NRI). The 1997 NRI pegged cropland acreage and pasture acreage at 5.4 million and 2.6 million acres, respectively, an area *70 percent* higher than the amount reported in the Census. The discrepancies trace to differences in data gathering procedures and to important differences in definition.

- The Census definition of farm and farmland is markedly different from definitions currently embedded in New York's state law, leading to another possible source of confusion over definitions.

- Using total output as the unit of measure, the definitions of farm and food incorporated into this study focus attention on industries with output valued in excess of $23 billion in 1996. These industries include the farm sector, agricultural services, and food manufacturing.

Forward and backward linkages were examined to better understand the dependencies between farm

and food production and markets inside New York, other domestic outlets, and exports to other countries. Farming exerts impacts on the New York economy through forward linkages to transportation, wholesaling, retailing, and food services. Some of those links are achieved within New York State and some are achieved out of state. Backward linkages between food and agricultural production in New York and other sectors of the wider New York economy are analyzed through the calculation of economic multipliers.

- Estimates of forward linkages suggest that 65 percent of total gross output in New York's dairy production sector is sold to in-state buyers -- almost exclusively to milk handlers and processors. Offshore export sales of dairy farm products are extremely low while about 35 percent of the total finds its way out of state to processors and handlers.

- A similar pattern is evident for New York's poultry and egg sectors and the cattle sector, and features large domestic exports and negligible offshore exports. In sharp contrast, the highly mixed "other livestock" sector features in-state sales of about 74 percent, with shipments offshore accounting for about 19 percent of total gross output; shipments to domestic outlets outside the state of New York are a relatively low 7.5 percent.

- The picture for New York crop production is varied, with the fraction of total gross output accounted for by in-state sales ranging from 53 to 86 percent depending on the commodity sector considered. Dependence upon in-state markets is the highest for New York's rapidly growing greenhouse and nursery industries, with nearly $9 of every $10 in gross output going to in-state sales.

- Available trend data suggest that exports originating with firms in the New York food manufacturing sectors have increased since the late 1980s. In contrast, exports of raw farm commodities, whether crops or livestock, exhibited little trend over the interval 1988-1999.

- Economic multipliers were calculated using total output and employment as units of measure. Output multiplier estimates generally fall in the range of 2, suggesting each new dollar of farm and food output for the state brings additional production valued at nearly 1 dollar. Output multipliers for food and agricultural sectors compare reasonably well with those associated with expansions or contractions in nonfarm sectors.

- Because of differences in relationships between output and employment, employment multipliers are far more robust than output multipliers. The aggregate employment multiplier for food manufacturing is estimated at 4.0. This finding suggests that for every additional new job created in food manufacturing in New York State, an additional three jobs are supported in industries and sectors structurally linked to the food manufacturing sector.

Important secondary or multiplier benefits are predicated on successful efforts to produce direct economic impact. The conditions that warrant new production in any single farm or food sector must be fully understood. Much of the contemporary discussion about agriculturally based economic development is rooted in conditions and circumstances that have been operative in New York State for many years.

- At the close of World War II, New York had about 125,000 farms. Rapid farm consolidation has dominated the rural landscape. New cost-price relationships, economic opportunities on and off the farm, and shifting social realities have generated consistent declines in farm numbers over the last 50 years.

- Farm consolidation, along with expanded competition for land from nonfarm uses, has resulted in continual decreases in farm acreage -- from 16 million acres in 1950 to just over 7 million acres in the late 1990s. The largest percentage of this acreage has reverted to natural forest cover after cropping and pasture operations were abandoned by farmers. The remaining acreage has been converted to residential, commercial, and transportation uses.

- Farm and farm acreage losses have not translated into farm output decreases be-

cause of striking gains in land and labor productivity. Using 1996 as a reference point, receipts from crop sales and livestock/livestock product sales were estimated at $1 billion and $2.1 billion, respectively. Nearly seven of every $10 in farm output is accounted for by livestock and livestock products. This ratio has remained essentially stable during the last two decades.

- Production agriculture is dominated by fluid milk production. The New York dairy industry accounts for 56 percent of total receipts from farm marketings. In dollar terms the dairy industry generates a dollar volume in the vicinity of $1.74 billion at present. Production levels fluctuate slightly from year to year, and milk prices have shown greater volatility in recent years. Shifts in these price and quantity relationships have resulted in fluctuations in total gross receipts that range from about $1.4 billion to nearly $1.8 billion during the 1990s.

- The New York poultry and egg sector is substantially smaller than the dairy sector but generates nearly $90 million in cash receipts each year. Receipts from poultry production have remained relatively stable throughout the last decade, with fluctuations in cash receipts ranging between $82 million and something in excess of $100 million per year during the 1990s.

- The New York farm sector generates about $130 billion per year from the sale of meat animals; production value was substantially lower in the late 1990s compared with earlier years. In the early 1990s, cash receipts from this source approached $250 million. Similarly, cash receipts from the sale of miscellaneous livestock -- such as swine, sheep, and goats -- have declined in recent years. Presently, miscellaneous livestock generated receipts in the $90 million a year range.

- Much of New York's crop acreage is used to produce feed and forage crops to support the livestock industries mentioned above. Hay crops are the largest block of New York crop acreage, but many New York farmers sell crops to generate cash for the farm business. Receipts from the sale of oil seed crops (almost entirely soybeans), field grains (corn primarily), and food grains (wheat primarily) totaled more than $193 million in 1999, down from a peak of $250 million in 1996.

- In 1999, cash receipts from sales of all fruit crops approached $209 million. New York also has a vibrant vegetable crops industry. Cash receipts from the sale of vegetable crops were as high as $356 million in the late 1990s. Sales of greenhouse and nursery products have ramped up in recent years, and in 1999 receipts from this source exceeded $275 million.

Year-to-year movements in farm and food production during the 21-year interval 1977-1998 were examined. For each year in the interval, farm and food production was assessed using three alternate units of measure: employment, earnings, and value added.

- Farm employment in New York State, during a period of rapid increases in labor productivity and growth in average farm size, decreased from nearly 100,000 jobs to about 59,500 jobs between 1977 and 1998.

- Job-making in agricultural services over the last two decades has increased dramatically. As a result, industries defined as agricultural services result in the same proximate number of jobs as those found in direct crop and livestock production. For the reference year 1998, agricultural services employment is estimated at just over 59,000 jobs, more than a two-fold increase over the employment estimated in 1977.

- Abrupt employment expansion in ag services is not anomalous because this service category relates to production agriculture in only a limited way. While inclusive of such farm services as soil preparation, custom crop harvesting, crop preparation services for marketing, and veterinary services for livestock, the agricultural services category largely deals with several nonfarm lines of economic activity. Along with farm animals and to a much larger extent, veterinary services extend to a variety of companion animals. Similarly, other companion animal

services such as animal boarding or kennels are included in the ag services sector. Another major area encompassed by agricultural services is activity related to New York's green industries, including landscape, lawn and garden services, ornamentals, and trees, along with a variety of establishments purveying services for forestry and fisheries sectors.

- Employment in food manufacturing does not show employment increases but mirrors the steady job losses that characterized production agriculture throughout the 1977-98 interval. As with farm and agricultural services employment, food manufacturing accounts for over 59,000 jobs, down from more than 96,000 jobs in the mid-1970s.

- Moving away from employment as a unit of measure provides a distinctly different impression of trend in some cases. Value added originating in farming, in sharp contrast to farm employment, has remained relatively stable and exhibits a slight upward trend in current dollar terms over the last two decades. Value added in agricultural services mirrors employment trends and has increased abruptly during the last two decades.

- By the close of the 1990s' decade, value added in agricultural services exceeded the value added in production agriculture. This suggests that, like the larger macro economy, New York food and agriculture are becoming a service-based set of industries.

- Value added in food manufacturing has moved in directions counter to movements in employment over the past two decades. These countermovements are expected because of sharp increases in labor productivity over time. Value added in food manufacturing has increased precipitously since the mid-1970s and presently stands at about $5.5 billion, up from just over $3 billion in 1977.

- Taken together, the gross state product originating in New York food and agriculture has increased dramatically during the last two decades. In current dollar terms, the value added in these three sectors has increased from more than $4 billion per year to more than $8 billion over the 20-year interval.

- Comparisons of value added measured, alternatively, in current dollar and constant (price adjusted) dollar terms show that the New York macro economy realized a 29 percent real increase in value added production over the 1986-98 interval; real value added in ag services increased at a rate comparable to the statewide trend, with a percentage increase of 30 percent between 1986 and 1999.

- Real value added in the New York farm sector fell below the 1986 base year throughout the late 1980s and 1990s. Real farm value added rebounded slightly in the late 1990s and presently stands at about 97 percent of the 1986 level. Real value added in food manufacturing displays little trend between 1986 and the mid-1990s. However, value added in food manufacturing has fallen in recent years and registered an index value of 90 percent in 1998.

- Production agriculture generates earnings in the range of about $500 million each year. Earnings in farming are highly erratic with often-abrupt year-to-year changes triggered by fluctuations in commodity prices and/or the vagaries of weather. Farm proprietors absorb most of the volatility in farm earnings. Earnings include payments to hired farm labor, but proprietors' earnings are a relatively large proportion of the total and move with increases and decreases in net farm income.

- Earnings originating in agricultural services have systematically increased and presently are about $1.1 billion, an amount significantly above that generated by production agriculture.

- Like ag services, earnings in food manufacturing have increased systematically despite declining employment during the last two decades. In 1998, food manufacturing earnings stood at about $2.8 billion, an amount nearly six times the amount realized from crop and livestock production.

A useful context for interpreting long-term trends in income and employment is performance in New York compared with the nation and key competitor states.

- In percentage terms, the 1977-98 decrease in farm employment in New York was approximately in line with the U.S. average. For the nation as a whole, farm employment fell from about 3.9 million to 3.1 million over this two-decade span, a decrease of about 19 percent. With the exception of California and Washington, all 11 competitor states included in this study exhibit similar farm employment trends.

- Nationally, farm employment per 100 persons decreased systematically from 1.8 to 1.2 over this period, on average. Almost identical rates of change occurred among New York's competitor states, although relatively smaller shares of the total population were engaged in farming. New York's level of engagement as reflected in employment/population ratios is markedly lower than any of these cases and ranged between 0.5 and 0.33 between 1977-98.

- New York registered very sizable increases in agricultural services employment over the last two decades, but realized one of the nation's more modest employment gains in these aggregate sectors. Nationally, the percentage increase was over 200 percent during this interval, compared with 113 percent in New York. Percentage gains were uniformly higher in competitor states, with percentage increases approaching or exceeding 250 percent in several states, capped by North Carolina's impressive 326 percent gain.

- Some state-level percentage increases were made from fairly small employment bases. Adjusting the employment data for population size showed that New York's competitor states, on average, moved in accordance with the national trend. New York, however, realized a breakaway in the early 1980s, and employment increases have been relatively modest in agricultural services since that time.

- Patterns are much the same for food manufacturing, with New York realizing the largest percentage decrease in food manufacturing employment among the states included in this summary. Nationally, food manufacturing has not been a vibrant source of employment, with jobs hovering in the range of 1,700,000 since the mid-1970s.

- A similar pattern emerges when attention turns to measures based on state gross product or earnings. Data on per capita value added (gross state product) and earnings both show that New York lags behind the nation and competitor states. While both product and earnings have increased in New York over the recent past, rates of change have stagnated beginning in the early 1980s, with no recovery evidenced in the data.

Agriculture-Based Economic Development: Trends and Prospects for New York

Nelson L. Bills*

Introduction

Policymakers, industry leaders, planners and economic development professionals in New York State are confronted with a set of fundamental questions about agriculture-based economic development (AED) and its potential to support and/or enhance the economic vitality of communities across the state. Some of these questions are: How might accelerated efforts to grow the state's food and farming industries play into mainstream economic development efforts in New York State? Are there unexploited opportunities to boost performance in agriculture and food sectors? What benefits might come to local economies from more emphasis on local farm and food systems, or from more aggressive efforts to target offshore markets? How can educators, community leaders, and public agencies intervene with farm and agribusiness firms in ways that lead to cumulative improvements in the economic and social climate for communities as well as farm and food production?

This report seeks to better inform some of these questions. It grew out of a joint project with the New York State Department of Agriculture and Markets. The overall purpose of this project was to begin the collaborative work needed to advance the discussion of development challenges and opportunities for the State and identify program milestones for the Commissioner.

The project blends an extension outreach effort and applied research and is organized around three general topics. They are:

I. Community Involvement in Agriculture Economic Development for NYS — An Educational Opportunity;

II. Agriculture Economic Development for New York State;

III. Benchmarking Market Enhancement Programs in New York's Key Competitor States.

Each topic was developed in collaboration with the Commissioner and his staff. Guidance was also received from a project advisory committee organized by the Commissioner. This committee met periodically to review data, methods, definitions, and opportunities for communicating research results to diverse audiences across the state.

This report deals with II above, and concentrates on the assembly of 1) baseline information on trends in New York farm and food production, including available state-level information on farm and food production for major market outlets and 2) estimates of interindustry relationships and economic multipliers for New York farm and food sectors. The report is organized around several sections. The first section introduces key definitions and discusses the sources of data employed in this study. Subsequent sections are organized around each of the above study objectives.

This study is less comprehensive than assessments of New York's food and agricultural sectors conducted on an intermittent basis in years past. In the 1960s, the Department of Agricultural Economics issued a series of reports under the general theme of "Toward the Year 1985". These reports were an extensive analysis of individual commodities, markets, and the production circumstances for communities across New York State; numerous development issues were

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addressed at the farm and sector level, and changes in farm and food production were projected. Nearly 20 years later, in the mid-1980s, the College collaborated with the New York State Department of Agriculture and Markets on a project of similar intensity, entitled "Agriculture 2000".

The study reported here is far more modest in scope. It does not contain projections or detailed assessments of individual commodities or commodity groups or insight from analysts with commodity-based interests in production and marketing issues. Rather, the intent is to help set the stage for a continuing discussion of New York's farm and food challenges and opportunities.

The motivation for the study is primarily related to programmatic needs in Albany and in the New York State Department of Agriculture and Markets. The Commissioner has focused the department's attention on agricultural economic development and is interested in baseline data and analysis which helps illuminate options and shows a way forward on farm and food-based economic development.

Although economic parameters and dimensions are stressed here, several other critical motivations for encouraging vibrancy in New York's farm and food sectors are acknowledged. Namely, farming and industries allied with farming produce a variety of widely acknowledged community, landscape, and environmental values for New Yorkers. These values are absolutely crucial to a full discussion of New York farm and food issues, but do not receive explicit treatment in this report because of limits on time and resources. The results reported herein do not diminish the statewide interest in husbanding these wider social and environmental values but provide more insight into the economic circumstances for farm and food.

Concepts and Definitions

Changes in the structure of farm and food production make review of definitions and concepts a critical first step in this study. Some of these structural changes are subtle and not easily detected in the data and evidence commonly used to describe these industries. The language and terminology used by data providers and development practitioners is not uniform. This study draws upon and integrates information and data series maintained and published by six Federal data providers in three separate agencies.

These data sources are interlocking but often feature materially different terminology and data management conventions. These differences are typically overlooked or assimilated in the economic literature; economic analysts are usually quite familiar with, and sometimes entertained by, the nuances in data and their meaning. During the course of this study, which included guidance from a broad-based advisory committee, it became clear that users who are less familiar with data sources and economic jargon can be confused by what appears at first glance to be substantive differences in the data. One accomplishment of this study is the arrangement of data and their interpretations in ways that speak to policy questions while meeting the needs of multiple audiences and users. These individuals want to participate in the policy discussion without becoming snarled in the linguistics and jargon embedded in economic data by well-intended economic analysts.

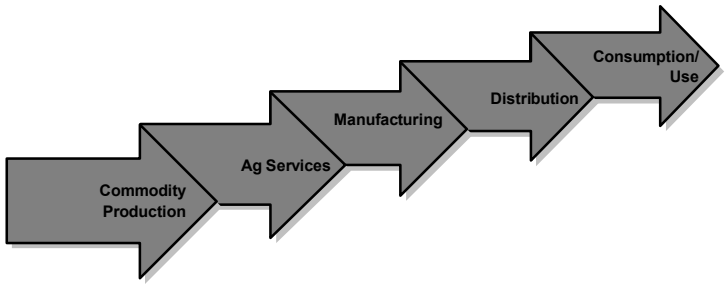
The farm and food system

The point of departure is a working definition of farm and food. One concern that prompted this study was that discussions of agricultural economic development often tend to be narrowly gauged, with a focus on one type of farm or industry. For example, it is not difficult to find commentators who are willing to use New York's largest farm industry, fluid milk production, as a metaphor for the state's food and agriculture industries. But conditions in any single New York industry, even its largest economic sector, hardly ever mirror the circumstances faced by other growers and producers. On the other hand, changes in technology, cost-price relationships, and shifts in consumer demand are encouraging farm, ag service, and food industries to adopt new business organizations and arrangements. Some of these adaptations are blurring the traditional lines between farm/nonfarm and food/nonfood endeavors.

For both reasons -- to avoid a myopic view and to recognize new business forms -- the organizing principle for this study was that the analysis should take the long view, considering to some extent all the elements of what has been referred to as the "food system". Such a construct is depicted in Figure 1, where economic activities ranging from behind-the-farm-gate food and fiber production to final food and fiber consumption and all the steps in-between are taken under consideration.

Farm and food business firms often cross the boundaries depicted in Figure 1 when they seek out oppor-

Figure 1. The Agriculture and Food System



tunities to diversify and grow their businesses. Following business growth and diversification strategies can make relatively simple businesses into multiproduct firms that combine production of farm commodities with downstream provision of services, processing, and/or distribution to consumers. Multiproduct firms are harder to accurately classify and are not always, if ever, accurately portrayed in published industry statistics. This adds another layer of difficulty to accurate descriptions of the New York farm and food sectors.

Examples of the problems caused by multiproduct firms abound. One profound example for New York agriculture and agricultural economic development is found in the arena of direct marketing. Strategies and tactics on the part of growers and producers to achieve direct contact (sales) with consumers are thought by many to be part and parcel of a community, farm-based economic development strategy. A frustration is devising ways to keep score on such efforts and accurately reflect them in the data surrounding the farming industry. Presently, Federal data managers attempt to take account of direct sales to consumers by farm operators while adhering to strict definitions of a farm product sale. To do so, data managers carefully discriminate among elements of a business unit that do and do not adhere to standing definitions of a "farm". Thus, a "firm", one business entity with both farm and nonfarm operations, may not be fully represented in farm statistics.

An example is the operation of a "farm market". Farm markets are engaged in wholesale/retail sales. Such markets are often, if not almost always, operated by individuals or corporations who "farm" by Census definition. The farm wholesale/retail operation, in turn, can, and oftentimes does, feature sales of produce from the attached farm operation along with the merchandising of any number of other products -- both food and nonfood -- processed (manufactured) on site or purchased at wholesale for resale. However, these manufacturing/retail activities are judiciously pruned from the statistical data gathered on agriculture (for the last two Ag Censuses, efforts have been made to account for "Value of agricultural products sold directly to individuals for human consumption", an accounting of product produced on the farm and sold to consumers). This leads to endless confusion over what the data represent and what one sees on the ground. For the latter, efforts to diversify a business and ensure its growth and long-term sustainability are often precisely the steps needed to add vibrancy to the local farm and food industry. The disconnect between data and the structure of farm and farm-related businesses will surely increase in magnitude as time goes on.

Even when business arrangements, business structures, and marketing channels are well understood, new or just-emerging products may test the imagery we all use to assign our own meaning to the terms "farm" and "food" or blur any neat lines between commodity production, services, and manufacturing. An example might be developments in biotechnology, which can lead to the use of farm plant and animal breeds as hosts for the production of new medical or industrial products. Clearly, the husbanding of the animal constitutes farming, but the principal product is a medical or industrial product rather than a farm commodity. Other examples can be found by considering changes in veterinary medicine, a traditional support industry for farming now largely organized around products/services for companion animals — equine, canine, and feline species in particular. Is the practice of a veterinarian, quite obviously an integral part of the economic fabric of both urban and rural communities, still to be classified as an "agricultural" service?

Conflicting definitions of farm and farming

With these issues in mind, our construct of the food system is anchored by commodity production on farms. Farm definitions are often the subject of academic and policy discussion, with distinctions drawn between "big" farms or "small" farms, "family" and "corporate" farms, "real" farms and "hobby" farms and so on. No attempt was made to advance or settle alternate farm definitions in this study. Rather, the definition used follows Federal statistics, which

count farms as places producing farm commodities having a market value of $1,000 or more per year. This definition is very inclusive and extends to operations that generate little, if any, net cash receipts for the farm operator in any given year. Based on this definition, the 1997 Census of Agriculture reported that New York has about 32,000 farms (USDA, 1999).

The definition of farmland in published agricultural statistics follows directly from the definition of farm and counts the acreage owned or leased by individuals (sole proprietors), partnerships, and corporations who conduct farming operations by Census definition (see Box 1). The last Census reported that New York has approximately 7.2 million acres of land in farms. Unfortunately, however, the five-year Census routinely undercounts farms and subsequently underestimates the acreage of land in farms. Undercounts are evidenced in annual estimates of farms and land in farms made by the New York Agricultural Statistics Service (NYASS, 2001a). In 1997, NYASS estimated farm numbers at 38,000 and land in farms at 7.8 million acres (USDA, 2001); that same year, as noted above, the Census pegged farm numbers at about 32,000 and land in farms at about 7.2 million acres (USDA, 1999). These are not inconsequential differences: underenumeration apparently reduces one's impressions of the State's total farmland pool by something approaching 10 percent. The collateral effect is to confuse the users once again with numbers materially different but labeled and packaged identically in alternate Federal publications and data series.

Referring to the Census of Agriculture, reported acreage of land in farms accounts for about one-fourth of the state's total land area. Accounting for underenumeration, as discussed above, increases this fraction slightly. In either case, land in farms is not synonymous with land actually used for crops or pasture for livestock. Each New York farm also contains acreage that can be called support land. Support land includes building spaces, roads and lanes, as well as some woodland acreage owned or leased by the farm operator.

An entirely different impression of farmland area comes from the U.S. Department of Agriculture's National Resources Inventory (NRI). The 1997 NRI pegged cropland acreage and pasture acreage at 5.4 million and 2.6 million acres, respectively, an area 70 percent higher than the amount reported in the Census (USDA, 2001). Some of the differences undoubtedly relate to differences in data gathering procedures, since the NRI is area-based point sample design, while the Census relies on survey responses by farmers. But the larger source of discrepancy, once again, relates to important differences in definition. The Census definition of farm does not turn on land cover, as with the NRI, but upon the market value of farm product sales. This definition can exclude acreages with crops and pasture as a land cover that generate little (under $1,000) or no revenue from farm product sales. The most important example is New York's equine industry. Many equine operations look like farms, take up considerable acreage used for crops and pasture, but are not organized to generate business revenue. Still other equine operations generate revenue, but not from farm commodity sales. Rather, the revenue comes from the provision of services (riding, training, boarding, and so on). Revenues from the provision of such services are out of bounds under prevailing farm definitions and such equine operations are not regularly counted in the Census. In contrast, the NRI makes an accounting of the landscape dimension of

Box 1: Census definitions of farm and land in farms

Land in Farms: Land owned, rented or leased from others, less land rented or leased to others.

All Land Owned: Report all land owned during the Census year whether held under deed, purchase contract or mortgage, homestead law, or as heir or trustee of an undivided estate. Include all land owned by you and/or your spouse, or by the partnership, corporation, or organization for which you are reporting.

All Land Rented or Leased FROM OTHERS: Report all land rented by you or your operation, including

- Land for agricultural use that you rented from others for cash
- Land you worked on a share basis (crop or livestock)
- Land owned by someone else that you used rent-free
- Land rented or leased BY THE ACRE from federal or state governments, Indian reservations, or railroads

All Land Rented or Leased TO OTHERS: Include all land rented out for any purpose

- Owned land rented to others for cash or a share of crops or livesck
- Land you rented from someone and then subleased to someone else
- Land worked for you by someone for a share of crops or livestock
- Land which you allowed others to use rent-free
- Land placed in the Conservation Reserve Program (CRP) or
- Wetlands Reserve Program (WRP) as acres rented to the government

Source: http://www.nass.usda.gov/census/census97/volume1/us-51/toc297.htm

such equine operations in determinations of land cover. That is, NRI technicians inventory cropland and pastureland regardless of whether the owner meets the Census definition of a farm. This means that equine operations are a key part of the rural and farm landscape in many locales but remain unrecognized in most farm statistics.

The substantial equine industry makes these data conventions increasingly anomalous and stilt the widely used and cited farm statistics for the State. For this reason, the USDA and the Commissioner of Agriculture and Markets periodically make provisions for one-off surveys of the New York equine industry. The most recent survey was conducted for calendar year 2000 and showed that New York had 30,000 places with equine in 2000 (NYASS, 2001b). In this survey a place is defined as anyone operating land on which equine are kept. Owners of equine boarding their animals on land they did not operate were excluded. Operators of places with equine were asked which type of activity best described their operation. Almost half of the operators, 49 percent, described their equine operation as noncommercial/nonfarm. Acreage in these operations exceeded 3 million acres, with about 0.9 million acres identified as fenced equine pasture.

Still further confusion can result when one turns to state law. The Census definition of farm and farmland and the land inventoried in the USDA NRI is markedly different from definitions currently embedded in New York's state law. Under New York's Agricultural Districts Law, Article 25 AA, several commodities and services are defined as crop or livestock production -- see Box 2. These definitions are used to administer agricultural assessments for farmland and allow local assessors to accurately identify acreage eligible for a reduced property tax bill. Along with definitions of farm product, the statute identifies "land used in agricultural production" (Box 3). The principal difference between the Federal farm definition and the state statute is that the latter has a considerably higher sales threshold ($10,000 on large land parcels and $50,000 on small land parcels), but other, more subtle, differences are also present. This means that the Census and the state statutes refer to materially different collections of rural land.

Box 2. Farm product definitions in state law

"Crops, livestock and livestock products" shall include:

- Field crops, including corn, wheat, oats, rye, barley, hay, potatoes and dry beans
- Fruits, including apples, peaches, grapes, cherries and berries
- Vegetables, including tomatoes, snap beans, cabbage, carrots, beets, and onions
- Horticultural specialties, including nursery stock, ornamental shrubs, ornamental trees and flowers
- Livestock and livestock products, including cattle, sheep, hogs, goats, horses, poultry, ratites, farmed deer, farmed buffalo, fur-bearing animals, milk, eggs and furs
- Maple sap
- Christmas trees derived from a managed Christmas tree operation
- Aquaculture products, including fish, fish products, water plants and shellfish

Source: New York State Consolidated Laws; Agriculture & Markets ARTICLE 25-AA, Agricultural Districts, S. 301

Box 3. Farmland definitions in state law

"Land used in agricultural production"

- Not less than ten acres of land used as a single operation in the preceding two years for the production for sale of crops, livestock or livestock products of an average gross sales value of ten thousand dollars or more
- Not less than ten acres of land used in the preceding two years to support a commercial horse boarding operation with annual gross receipts of ten thousand dollars or more,

Land used in agricultural production shall also include:

- Rented land which otherwise satisfies the requirements for eligibility for an agricultural assessment,
- Land of not less than ten acres used as a single operation for the production for sale of crops, livestock or livestock products which does not independently satisfy the gross sales value requirement, and currently is being so used under a written rental arrangement
- Land used in support of a farm operation
- Farm woodland which is part of land which is qualified for an agricultural assessment
- Land set aside through participation in a federal conservation program
- Land of less than ten acres used as a single operation in the preceding two years for the production for sale of crops, livestock or livestock products of an average gross sales value of fifty thousand dollars or more
- Land under a structure within which crops, livestock or livestock products are produced

Source: New York State Consolidated Laws; Agriculture & Markets ARTICLE 25-AA, Agricultural Districts, S. 301

Measuring farm and food output

Measurement of food and fiber production is relatively straightforward but does not seem transparent to some observers because of differences in terminology. As mentioned above, we draw on data from six different providers in three Federal agencies. These are: the USDA's National Agricultural Statistics Service, the New York State Agricultural Statistics Service, the USDA Census of Agriculture, the USDA's National Resources Inventory, the Bureau of Economic Analysis in the U.S. Department of Commerce, and the USDA's Economic Research Service (ERS). Each provider employs the same general accounting principles and crafts data series from identical core data sets. But often different words are used, with nuances that are largely of academic interest only. This means that the data sources are directly comparable on conceptual grounds, but confusion over language and terms distracts users and can lead to misinterpretation.

To reduce the confusion over words, a uniform terminology was adopted for this study as shown in Box 4. The central concept is gross output, which must be clearly distinguished from the cash receipts from product sales realized by a farm or firm. There is a tendency to use the terms "output", "cash receipts from product sales", and "farm marketings" interchangeably, but for several reasons this is at odds with the data and sound accounting practices. The term "output" is reserved for the most inclusive definition of income sources for a business. Although cash receipts from product sales constitute the largest component of total output or business income, several other sources are regularly tallied. These sources include "other business income" which, in the case of a farm business, is defined to include Federal farm program payments, income generated by custom work or leasing out farm equipment and services, and casual sales of forest products (see Box 4).

Federal estimates of total farm income also include substantial imputed income. Imputed income can be income "in-kind" or income not measurable by looking at money transactions in any single year. The largest imputation in Federal farm statistics is the imputed value of owner occupied housing; the value of home consumption -- crop or animal products commodities produced and consumed on the farm by the farm household -- is also estimated. These imputations, along with an estimate of annual inventory changes, can make a very noticeable difference in the annual output estimate. For example, "other farm income", including imputed income and payments received by New York farmers under Federal farm programs, added $218 million to New York farm gross output in 1996 (US Department of Commerce — see Appendix Table A-2). This was 7 percent of total gross output reported for the New York farm sector during calendar year 1996.

A working definition of farm and food

Many, if not most, discussions of farm and food in New York take into account only crop and livestock production, cash receipts, and other farm income at the farm gate. However, this study adheres to the idea of a food system. What list of industries can be used for an operational definition of the farm and food system? A useful description of the options is depicted in Figure 2. Using total output as the unit of measure, several component parts of the food system can be identified with alternate definitions turning on the inclusion or exclusion of major industrial sectors. A narrow "Definition A" would confine discussion to farm commodity production on New York

Box 4. Schematic showing calculation of total output, value added, and proprietor's (net business) income

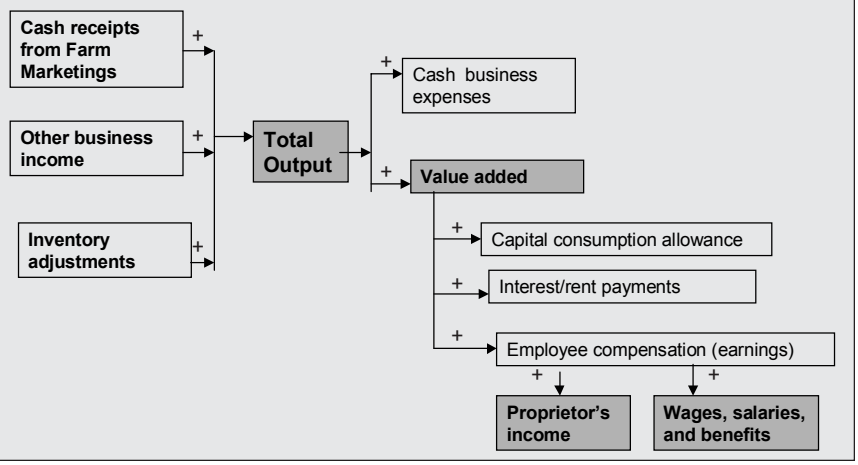
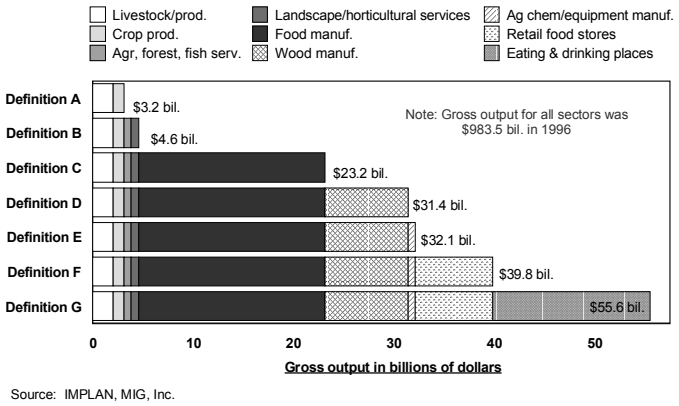


Figure 2. Defining Food and Agriculture: Value of Output by Industrial Sector, New York State, 1996



Source: IMPLAN, MIG, Inc.

farms as outlined above. A wider definition, "B" in Figure 2 would take the broad category "agricultural services" into account. Under Federal data gathering methodology and definitions, agricultural services include the categories of activity shown in Box 5[1]. Important components of the service sector include veterinary and other animal services. Included are services for commercial livestock and poultry producers and for owners of sport and companion animals. The latter, of course, not only includes equines, but also tends to further blur the line between agricultural and nonagricultural services by extending to a variety of companion animals and avian species.

A second major category of agricultural services relates to landscape, lawn, garden, and allied services. Many of these services, indeed the bulk of them, are provided to nonfarm clients, but often showcase the connections between New York's "green industries" and allied services (Box 5).

An even more inclusive definition of food and agriculture extends to manufacturing activity. This inludes the manufacture of food and kindred products (see Box 6), wood manufacturing, and agricultural chemicals/farm equipment manufacturing. These components, as reflected in definition "E" in Figure 2, extend the New York farm and food portfolio to gross output valued at just over $32 billion in 1996. Glancing further down the food distribution chain to food retailing and the services provided by eating and drinking establishments brings the value of that portfolio up to slightly more than $55.5 billion in the mid-1990s. It should be noted that, even with this most expansive definition, the value of farm and food output in New York State is barely more than 5 percent of the total gross output generated statewide (see Figure 2)[2].

Total output is a useful reference point for economic activity in the New York macro economy. However, several other widely received measures are available. Considering alternate measures can be important because they are not always well correlated with each other or with gross output, giving varying impres-

[1] The Federal definition of "agricultural services" is very comprehensive but probably excludes many lines of economic activity generally thought of in terms of "service" to agriculture: marketing and processing of raw farm commodities, their transport from the farm, financial and credit services, machinery repair, and so on. For purposes here, the more narrow definition of ag services is adopted in order to preserve access to published statistics. Some of these omissions can be dealt with in published data and some cannot. Many marketing and processing services fall into the category of food manufacturing and can be readily accounted for. These "accounted for services" largely fall on the output side. It is more difficult, and often impossible, to accurately segregate input services supplied directly to operators of agricultural businesses. Suppliers of these input services routinely service both farm and nonfarm customers and there is no convenient way to segment and showcase the farm component of that service base. This challenge to accurately describe farm input services is worsening over time as local farm service firms dwindle in number or diversify their businesses to attract nonfarm customers.

[2] Both the economic literature and data conventions used by analysts are far from settled. A recent USDA study concluded that "food and fiber industries" accounted for about 13 percent of the total U.S. gross domestic product (Lipton, et al, 1998). The USDA measurement may be defensible but it is very expansive, extending well beyond crop and livestock production, which according to USDA estimates accounted for less than one percent of total U.S. gross domestic product (GDP) in 1999. The remainder, over 13 percent of total domestic product, was attributed to mining, manufacturing, retail wholesale trade, transport, and services sectors deemed by the USDA to be linked to the production of raw food and fiber commodities. Nearly one-third of this total is accounted for by wholesale and retail trade activities (food and beverage retailing and wholesaling) along with trade in apparel and fibers, and tobacco.

Box 5. Establishments classified as agricultural services

- Soil Preparation Services
- Crop Planting, Cultivating, and Protecting
- Crop Harvesting, Primarily by Machine
- Crop Preparation Services For Market, except Cotton Ginning
- Veterinary Services For Livestock
- Veterinary Services for Animal Specialties
- Livestock Services, Except Veterinary
- Animal Specialty Services, Except Veterinary
- Farm Management Services
- Landscape Counseling and Planning
- Lawn and Garden Services
- Ornamental Shrub and Tree Services
- Timber Tracts
- Forestry Services
- Finfish Marine Products
- Shellfish Marine Products
- Miscellaneous Marine Products
- Fish Hatcheries and Preserves
- Hunting and Trapping, and Game Propagation

Source: US Bureau of the Census

sions of the farm and food sectors in some cases. These include measurements of value added, earnings (personal income generated by operating a business or working for a wage or a salary), and employment.

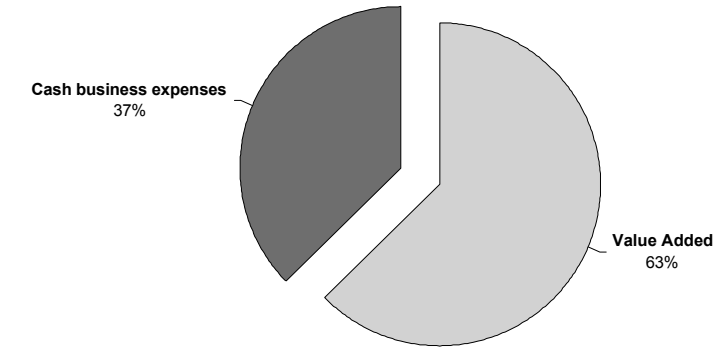
To provide the necessary contrast, relationships between the alternate units of measure are shown in Box 4 and further defined in Figures 3-5. Following standard data and accounting methods, value added by any single business firm, in any single industry or sector is defined as a derivative of total output, calculated by subtracting business expenses from total gross output (Box 4). In 1996, cash business expenses accounted for about 37 percent of total output in the entire New York State economy (Figure 3). The remainder is defined as value added. The value added measure is routinely used at the national and state levels to define, respectively, gross domestic output (GDP) and gross state product (GSP). The

Box 6. Establishments classified as food manufacturing (food and kindred products)

- Meat Packing Plants
- Sausages and Other Prepared Meats
- Poultry/ Egg Processing
- Creamery Butter
- Natural, Processed, and Imitation Cheese
- Dry, Condensed, and Evaporated Dairy Products
- Ice Cream and Frozen Desserts
- Fluid Milk
- Canned Specialties
- Canned Fruits, Vegetables, Preserves, Jams, and Jellies
- Dried and Dehydrated Fruits, Vegetables, and Soup Mixes
- Pickled Fruits and Vegetables, Vegetable Sauces and Seasonings, and Salad Dressings
- Frozen Fruits, Fruit Juices, and Vegetables
- Frozen Specialties, NEC
- Flour and Other Grain Mill Products
- Rice Milling
- Prepared Flour Mixes and Doughs
- Wet Corn Milling
- Dog and Cat Food
- Prepared Feed and Feed Ingredients for Animals and Fowls, Except Dogs and Cats
- Bread and Other Bakery Products, Except Cookies and Crackers
- Cookies and Crackers
- Sugar, Including Refining
- Candy and Other Confectionery Products
- Chocolate and Cocoa Products
- Chewing Gum
- Salted and Roasted Nuts and Seeds
- Cottonseed Oil Mills
- Soybean Oil Mills
- Vegetable Oil Mills, Except Corn, Cottonseed, and Soybeans
- Animal and Marine Fats and Oils
- Shortening, Table Oils, Margarine, and Other Edible Fats and Oils, NEC
- Malt Beverages
- Malt
- Wines, Brandy, and Brandy Spirits
- Distilled and Blended Liquors
- Bottled and Canned Soft Drinks and Carbonated Waters
- Flavoring Extracts and Flavoring Syrups NEC
- Canned and Cured Fish and Seafood
- Prepared Fresh or Frozen Fish and Seafoods
- Roasted Coffee
- Potato Chips, Corn Chips, and Similar Snacks
- Manufactured Ice
- Macaroni, Spaghetti, Vermicelli, and Noodles
- Food Preparations, NEC

Source: US Bureau of the Census

Figure 3. The New York Macro Economy: Total Gross Output



New York's Total Gross Output: $983.5 billion in 1996

Source: IMPLAN, MIG, Inc.

value added measure is important because it avoids double-counting the money value of production by an individual business firm, an entire industry, or industrial production aggregated to the state or national level directly comparable.

Value added, in turn, is defined to include employee compensation, capital consumption (depreciation) allowances, and interest/rent (Box 4). In 1996, employee compensation accounted for 63 percent of value added in the New York macro economy (Figure 4). Employee compensation, in turn, includes the wages, salaries and benefits of hired employees along with the net business income enjoyed by business proprietors. Income accruing to business proprietors accounted for about 12 percent of total employee compensation in 1996 (Figure 5). Estimates of income to business proprietors correspond exactly to "net farm income", the widely received reference point for farm and farm policy discussions.

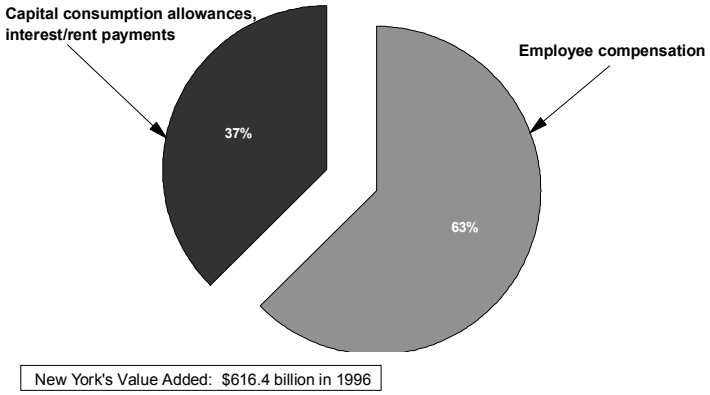
Forward and Backward Linkages

With a full understanding of concepts and definitions in mind, we turn to an assessment of the position of farms and food production in the New York economy. This positioning is discussed in terms of both forward and backward linkages with other sectors and with markets inside New York, other domestic outlets, and exports to other countries. Farming, agricultural services, and food processing exert impacts on the New York economy through forward linkages to transportation, wholesaling, retailing, and food services. Some of those links are achieved within New York State and some are achieved out of state. Unfortunately, relatively little information can be gleaned from published sources to fully understand these forward linkages. The U.S. Department of Agriculture collects and disseminates substantial data each year on in-state commodity production. In a few cases, for selected vegetable and fruit commodities, the USDA data track sales into fresh markets and sales to processors. However, for the larger volume of production, relatively little is known about the fate of in-state crop and livestock production.

Some additional insight can be obtained from the five-year Census of Agriculture. The Census reports on the volume of direct sales to consumers. These data can be arranged geographically or for farms that are classified according to their principal lines of commodity production. But again, this information is piecemeal and does not extend to a comprehensive description of sales in state or to transactions involving shipments elsewhere in the U.S. or abroad.[3]

[3] Questions about in-state production and its distribution to consumers in-state are an active area of research. Much is known about food consumption patterns, based on food disappearance data reported by the USDA and panel data showing detailed information on patterns of food intake by individual consumers. These data can be arranged to generate global estimates of in-state consumption of major and minor food items. But many questions remain on the marketing channels that in-state farm and food production follow. Producers and growers are often selling into a variety of markets and dealing with a variety of intermediaries who are doing business between the farm gate and final users of farm production. Selected contacts with representatives from food manufacturing firms over the course of this study suggest that building a database that would accurately depict movements of processed goods to final users would be difficult.

Figure 4. The New York Macro Economy: Value Added



Source: IMPLAN, MIG, Inc.

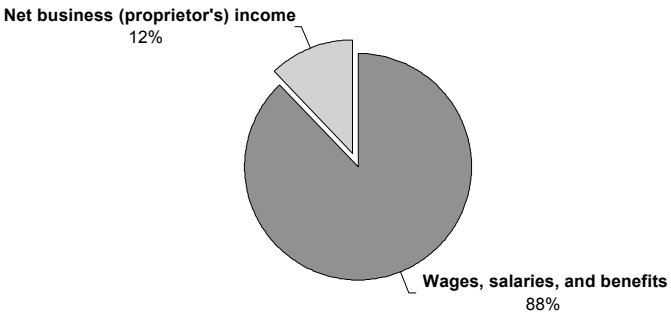
Forward Linkages

With these relatively severe data limitations in mind, two aggregate data sources were used to generate some base information on transactions involving in-state production of farm and food products. The first comes from IMPLAN, an input/output model describing estimates of transactions between nearly 500 industrial sectors in the New York economy. This model is based on structural relationships between industries found at the national level and reported by the U.S. Department of Commerce, Bureau of Economic Analysis. These data allow estimates of forward linkages to in-state buyers, shipments to foreign markets, and exports to other states in the U.S. Results are summarized in Figures 6 and 7 for major farm production sectors in the New York economy. Turning first to dairy farm products, the IMPLAN estimates suggest that 65 percent of total gross output in New York's largest farm production sector is sold to in-state buyers -- almost exclusively to milk handlers and processors. As expected, offshore export sales of dairy farm products are extremely low and estimated here at just 0.2 percent. The remaining production, amounting to 35 percent of the total, finds its way out of state to processors and handlers (Figure 6).

A similar pattern is evident for New York's poultry and egg sectors, with in-state sales to processors and handlers estimated at 57 percent. Negligible amounts of poultry and egg products are estimated to be sold into offshore markets, with the remaining nearly 42 percent finding its way to exports out of state but to domestic markets. The cattle sector features even larger domestic exports, pegged at 73 percent of total gross output; again, exports offshore are negligible with 26 percent of total production estimated to be sold in state (Figure 6). Finally, and in sharp contrast, the highly mixed "other livestock" sector features in-state sales of about 74 percent, with shipments offshore taking up about 19 percent of total gross output. Shipments to domestic outlets outside the state of New York are a relatively low 7.5 percent.

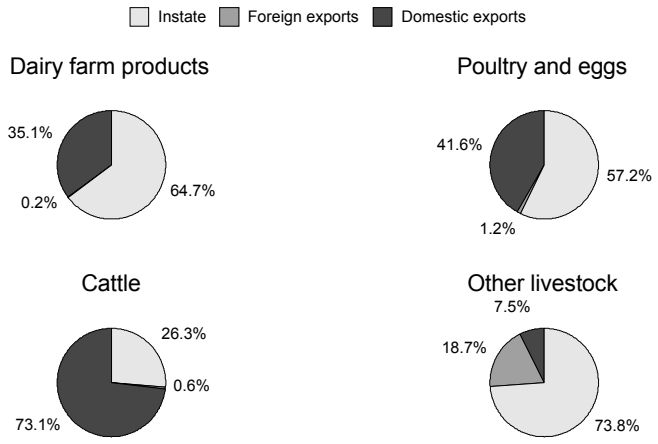
The picture for New York crop production is equally varied, as shown in Figure 7. Upon inspection, in-state sales predominate for all of these commodities. The fraction of total gross output accounted for by in-state sales ranges from 53 to 86 percent depending on the commodity sector considered. Not unexpectedly, depen-

Figure 5. The New York Macro Economy: Employee Compensation



Source: IMPLAN, MIG, Inc.

Figure 6. Estimated Destination of New York Livestock/Livestock Products, 1996



Source: IMPLAN.

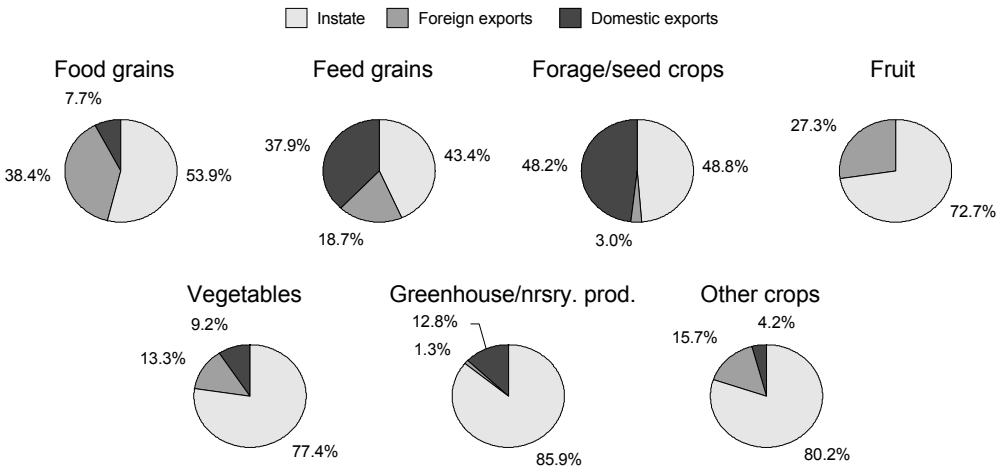
dence upon in-state markets is the highest for New York's rapidly growing greenhouse and nursery industries, with nearly $9 of every $10 in gross output going to in-state sales.

Some limited indications of trend in the important foreign export market are available from unpublished data (Figure 8). These data, based on analysis of the Census Bureau data on export shipments, suggest that exports originating with firms in the New York food manufacturing sectors have increased since the late 1980s. In contrast, exports of raw farm commodities, whether crops or livestock, exhibited little trend over the interval 1988-99.

Backward Linkages

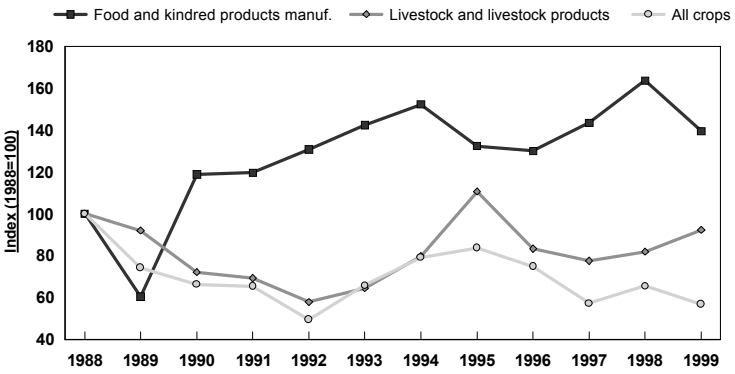
Backward linkages between food and agricultural production in New York and other sectors of the wider New York economy are analyzed through the calculation of economic multipliers. The economic multiplier is an important tool in economic impact analysis. Formal study and our own practical experience indicate that industries are interdependent and that expansion or contraction in one industry is likely to have some far-reaching implications. As noted in this study, a substantial share of total gross output in the New York State economy is comprised of cash business expenses. To reiterate, these are transactions between businesses to acquire the inputs needed to

Figure 7. Destination of New York Crop Output, 1996



Source: IMPLAN.

Figure 8. Index (1988=100) of Estimated Exports of Agriculture and Food Manufacturing Products, New York, 1988-99



Source: MISER.

deliver additional product or service to a final user[4] . One aspect of this project has been to update information on these cash expenses and their generative impacts for the state. Assessment of such generative impacts is generally referred to as multiplier analysis.[5]

The object of multiplier analysis is to trace out the interrelationships between sectors and construct quantitative measures of the impact associated with increasing or decreasing a line of economic activity. The idea traces to economic base theory which classifies goods and services sold outside the region's boundaries as "exports", and hence, basic. Conversely, goods and services produced by the nonbasic sector are consumed within the region's boundaries. Expansion of the basic sector of the economy necessarily entails added production in these support industries, particularly in terms of intermediate inputs, all of which adds to the overall development of a regional economy.

The economic multiplier summarizes the cumulative (direct, indirect, and induced) effect of an initial change in final demand plus the resulting series of successive rounds of spending within the local economy. It is the ratio between the total change in spending and the initial change in final demand (or the income or employment implied by it).

Multipliers are constructed based on a "snapshot" of a regional economy. That is, the economic multiplier is governed by the pattern of economic transactions between firms and the final users of their products for a single year. Lots of transactions between in-state business firms make for relatively large economic multipliers; relatively fewer transactions mean smaller multipliers. This means that multipliers can go out of date as structural relationships (patterns of transactions) between sectors change. Structural changes can emanate from technological developments, important shifts in relative prices, regional trade patterns, and several other sources.

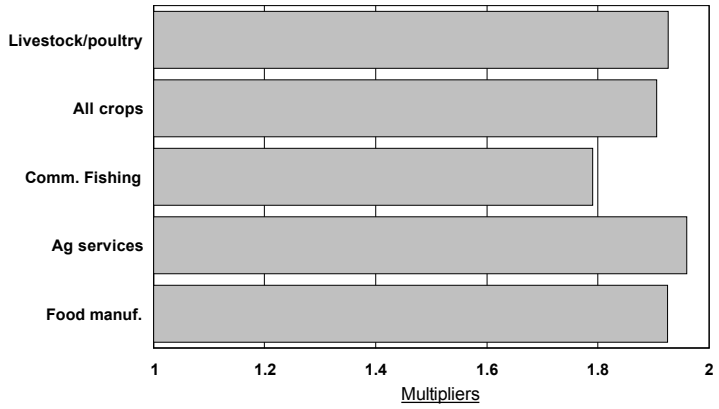
Another, and closely related, concern with multipliers is that they best represent the effects of small or marginal changes in output in any one sector. Large shifts in a regional economic system require a more detailed analysis before their effect on total income or employment can be measured. Finally, multiplier estimates rest on models utilizing local secondary data combined with coefficients from a national model. This procedure avoids the prohibitively high costs of conducting an exhaustive survey of transactions in a regional economy. However, reliance on this procedure requires the assumption that differences between the structure of the local economy and the national economy can be accurately measured. The restrictiveness of these assumptions is less severe as one progresses from a county-level economy to a state-level economy.

Multipliers can be calculated using several units of measure. The measures used in this study are total output and employment. The former provides a use-

[4] Final use in regional economic models makes allowances for inventory adjustments, expenditures on capital account, and deliveries of goods and services to local households or to buyers out of state (exports).

[5] For earlier work on input/output analysis and the New York State economy, see Boisvert and Bills; Jack, Bills, and Boisvert, 1996a; Jack, Bills, and Boisvert, 1996b.

Figure 9. Output Multipliers for Selected Farm and Food Sectors, New York



Source: IMPLAN.

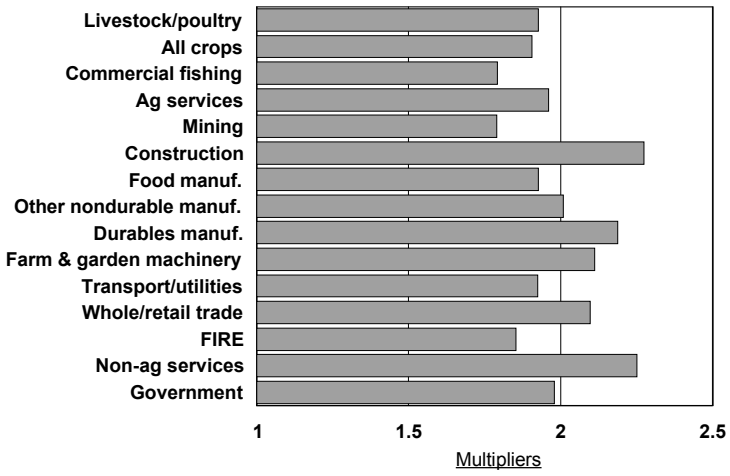
ful reference point for analysis because it shows an estimate of the generative effects associated with business revenue expansion or contraction across New York food and farm industries. These data are often of interest to a variety of audiences concerned with the impacts of individual farm and food sectors.

Output multipliers for selected farm and food sectors in the New York State economy are shown in Figure 9. These estimates were calculated from the IMPLAN input/output model and provide an estimate of the total generated effects associated with one unit, that is, $1.00 additional delivery of product to a final user. Because of structural interdependence between sectors, new production in a food or agricultural sector will generate successive rounds of transactions as firms backward linked to these industries also adjust output to meet the intermediate needs for farm and food production. These estimates take into account the first dollar of direct requirements along with the dollar value of additional production required to sustain the unit increase in farm and food production. These values, as shown in Figure 9, generally fall in the range of 2, suggesting each new dollar of farm and food output for the state brings additional production valued at nearly 1 dollar. The estimates take into account both the indirect effects of new industrial production and the induced effects associated with added amounts of household consumption expenditures and additional output by state and local governments.

To achieve additional precision on the multiplier question, the model results for several aggregated sectors of the New York economy are presented in Figure 10. These results allow one to compare the generative effects of new farm or food production with those associated with new output in nonfarm sectors of the New York economy. Looking at aggregated sectors suggests that output multipliers for food and agricultural sectors compare reasonably well with those associated with expansions or contractions in nonfarm sectors.

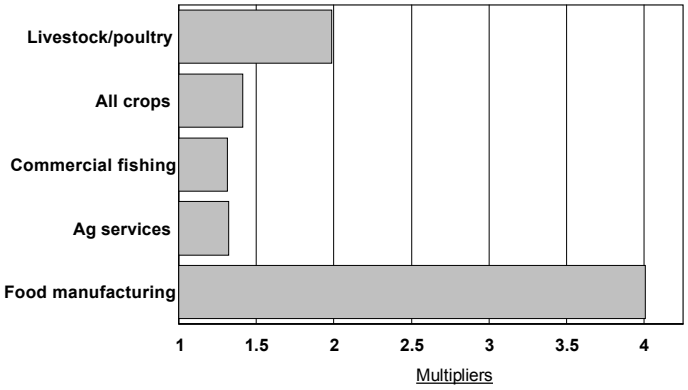
Because of differences (often material differences) in relationships between output and employment, results arranged using employment as a measurement unit portray different outcomes (Figure 11). An immediate observation is that the employment multipliers are far more robust than the output multipliers. Indeed the aggregate multiplier for food manufactur-

Figure 10. Output Mulitipliers for Selected Industrial Sectors, New York



Source: IMPLAN.

Figure 11. Employment Multipliers for Selected Farm and Food Sectors, New York



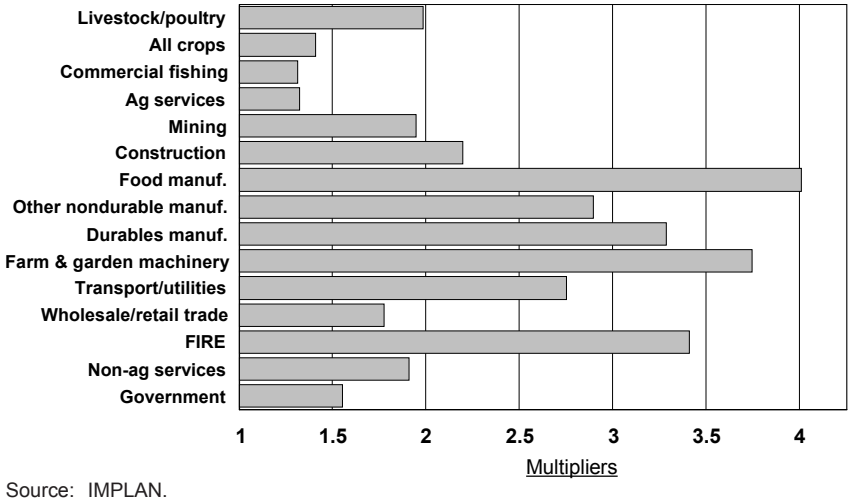
Source: IMPLAN.

ing amounts to 4.0 using employment as a unit of measurement. This finding suggests that for every additional new job created in food manufacturing in New York State, an additional three jobs are supported in industries and sectors structurally linked to the food manufacturing sector. These structural linkages include relationships and transactions with production agriculture, but also extend to a variety of service industries that depend upon food manufacturing as a sales outlet for their proucts and services. Similarly, the employment multiplier for livestock and poultry is a relatively robust 2.0, suggesting one additional job for every new job created in the sector.

The conclusion that employment benefits associated with expanded food manufacturing output in New York State are relatively robust is sustained when the frame of reference is the entire macro New York economy, as shown in Figure 12. Model results suggest that food manufacturing exerts one of the highest employment multiplier effects of any industry in the state.

Because this study is preoccupied with farm and food policy for the state, the IMPLAN model results were disaggregated to derive output and employment multipliers for selected industries in the farm, agricultural services, and food manufacturing sectors. Results are displayed in Boxes 7 and 8. As expected, the disaggregated results show that the generative effects of new in-state production of farm and food products vary materially among individual

Figure 12. Employment Multipliers for Selected Industrial Sectors, New York



Source: IMPLAN.

Box 7. Disaggregated output and employment multipliers for selected farm and ag services sectors, New York, 1996

Sector	Output	Employment
Dairy Products	1.83	2.24
Poultry and Eggs	1.58	1.91
Cattle	1.89	1.56
Sheep, Lambs and Goats	1.91	1.23
Hogs, Pigs and Swine	1.73	1.48
Food Grains	1.96	1.27
Feed Grains	1.87	1.46
Hay and Forage Crops	1.87	1.18
Fruit	1.92	1.50
Vegetables	1.92	1.85
Oil Bearing Crops	1.95	1.36
Forest Products	1.80	1.92
Greenhouse and Nursery Products	1.90	1.50
Commercial Fishing	1.98	1.42
Agricultural, Forestry, Fishery Services	1.95	1.44
Landscape and Horticultural Services	1.98	1.31

Source: IMPLAN

Box 8. Disaggregated output and employment multipliers for selected food manufacturing sectors, New York, 1996

Sector	Output	Employment
Meat Processing	1.64	2.72
Dairy Processing	2.26	5.72
Canned Fruits and Vegetables	2.00	3.14
Dehydrated Food Products	1.89	2.16
Pickles, Sauces, and Salad Dressings	1.83	3.66
Frozen Fruits, Juices and Vegetables	1.97	3.10
Food Grain Processing	2.15	5.46
Dog, Cat, and Other Pet Food	2.00	4.91
Prepared Livestock/Poultry Feeds	1.81	4.52
Bakery,Confections, Nuts	1.97	2.75
Beverages	1.95	5.49
Fish and Seafood Products	1.68	2.06
Potato Chips & Similar Snacks	1.81	3.45

Source: IMPLAN

industries, depending on the type of commodity or service. Turning first to farm commodity production, output multipliers vary within a relatively narrow range of about 1.7 to just under 2.0. Similarly, multiplier estimates for agricultural services approach 2.0 (Box 7). However, use of employment as a unit of measure distinguishes dairy products in a small but noticeable way. The employment multiplier for new dairy production in -state is estimated at 2.24.

These multiplier relationships persist when attention turns to food manufacturing as shown in Box 8. Disaggregated multipliers for food manufacturing using product output as the unit of measure range from 1.64 to 2.26, with the highest multiplier garnered in the New York dairy processing sector. Robust multipliers for dairy processing carry over to the employment side as well, with an estimated employment multiplier on additional output in the dairy processing sector estimated at 5.72. An equally robust multiplier is estimated for New York's food grain processing sector along with beverages production. Employment multipliers for those two sectors are estimated at 5.46 and 5.49, respectively. Multipliers also approach 5.0 for the New York livestock/poultry prepared feeds sector. The sector is responsible for the manufacturing and delivery of mixed and blended feeds to livestock and poultry producers.

Farm and Food Trends in New York State

These findings on backward linkages and economic multipliers add more perspective to New York's food and agriculture system. As noted above, we found that in 1996 New York's agriculture and food sectors -- farms, ag services, and food manufacturing -- generated an impressive $23.2 billion. On a relative basis, this is a small percentage of the state's total gross output, but the multiplier estimates confirm the anecdotal evidence, which suggests that food and agriculture exerts a relatively large generative effect on the New York economy. Compared with other New York industries, farm and food firms make relatively large proportions of their cash business expenditures in-state. This means that efforts to enhance production in these sectors produce relatively large secondary and tertiary benefits for industries linked to farm and food production.

However, important secondary or multiplier benefits are predicated on successful efforts to produce direct economic impact. That is, the conditions that warrant new production in any single farm or food sector must be fully understood. To further this understanding, long-term trends in farm and food production are examined in this section. These trends are important because much of the contemporary discus-

sion about agriculturally based economic development is rooted in conditions and circumstances that have been operative in New York State for many years.

At the close of World War II, New York had about 125,000 farms. Rapid farm consolidation has dominated the rural landscape of the state since that time as the farming industry reacted to new cost/price relationships, economic opportunities on and off the farm, and shifting social realities. As a result, farm numbers have declined consistently over the last 50 years (Figure 13). Some farm loss over this span is due to a 1974 change in farm definition that increased the volume of sales needed to qualify as a farm. In earlier years the definition turned on both acreage and value of farm production thresholds. Farm numbers have remained relatively stable in the 1990s. Census data show that farm businesses continue to be consolidated into larger economic units, but smaller part-time farms have increased over the last decade. Today, more than 40 percent of all New York farms can be classified as residential farms because the operator has a full-time job off the farm.

Farm consolidation, along with expanded competition for land from nonfarm uses, has resulted in continual decreases in farm acreage (Figure 14). Land in farms decreased from 16 million acres in 1950 to just over 7 million acres in the late 1990s. There are no comprehensive data on land conversion over this 50-year interval, but the circumstantial evidence suggests that much of this acreage was idled and has reverted to natural forest cover when cropping and pasture operations were abandoned by farmers. The remaining acreage has been converted to residential, commercial, and transportation uses.

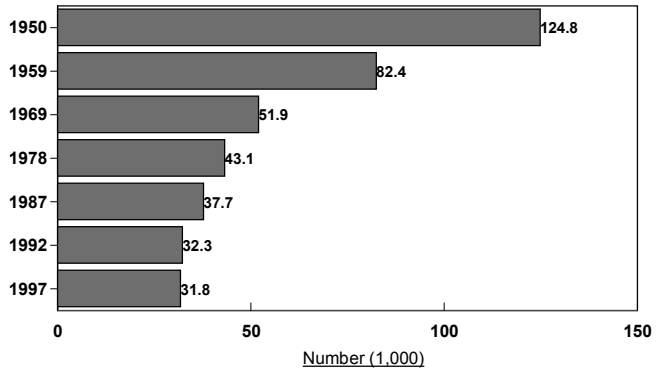
Farm and farm acreage losses have not translated into farm output decreases because of striking gains in land and labor productivity in the industry. Cash receipts, either from the production of crops, livestock, or livestock products, are shown in Figure 15. Using 1996 as a reference point, receipts from crop sales and livestock/livestock product sales were estimated at $1 billion and $2.1 billion, respectively. Nearly $7 of every $10 in farm output is accounted for by livestock and livestock products. This ratio has remained essentially stable during the last two decades, despite some increase in total farm output.

Production agriculture is dominated by fluid milk production. The New York dairy industry accounts for 56 percent of total receipts from farm marketings. In dollar terms the dairy industry presently generates a dollar volume in the vicinity of $1.74 billion (Figure 16). Production levels fluctuate slightly from year to year, and milk prices have shown greater volatility in recent years. Shifts in these price and quantity relationships have resulted in fluctuations in total gross receipts that range from about $1.4 billion to nearly $1.8 billion during the 1990s.

The New York poultry and egg sector is substantially smaller than the dairy sector but generates nearly $90 million in cash receipts each year (Figure 17). Receipts from poultry production have remained relatively stable throughout the last decade, with fluctuations in cash receipts ranging between $82 million and something in excess of $100 million per year during the 1990s.

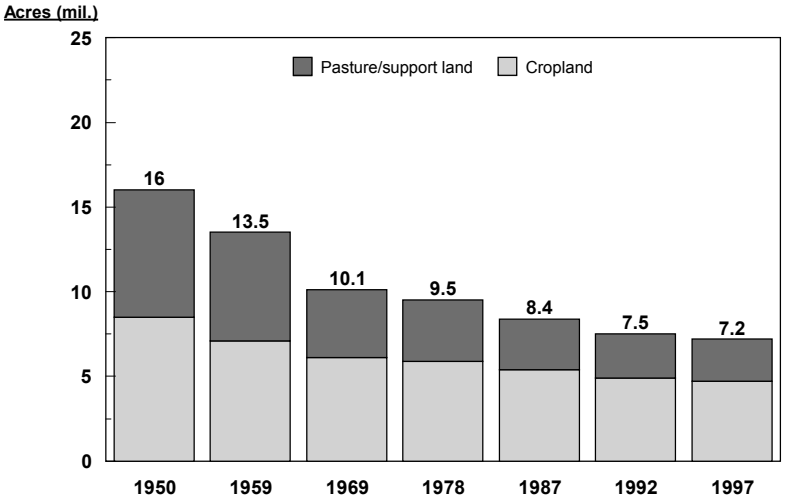
Apart from dairy and poultry production, the New York farm sector generates about $130 billion per year from the sale of meat animals (Figure 18). This production value was substantially lower in the late 1990s compared with earlier years. In the early 1990s, cash receipts from this source approached $250 million. Similarly, cash receipts from the sale of miscellaneous livestock -- such as swine, sheep, and goats -- have declined in recent years. Presently, miscellaneous livestock generated receipts in the range of $90 million a year (Figure 19).

Figure 13. Farm Numbers for New York, Selected Census Years, 1950-1997



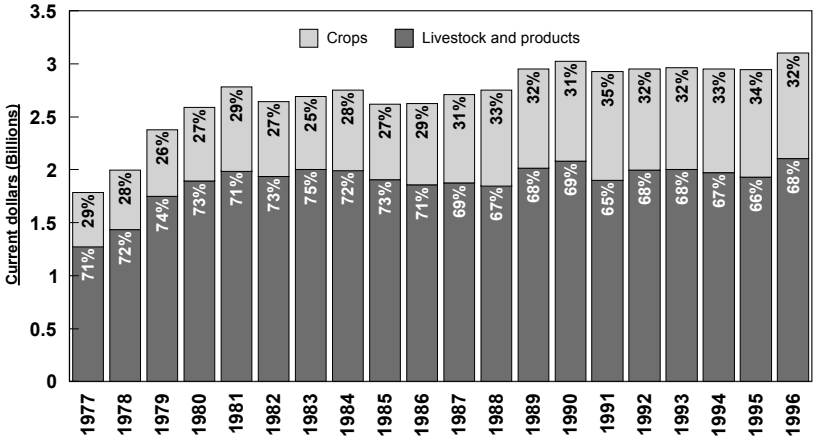
Source: US Dept. of Commerce. See Appendix Table A-1 for data.

Figure 14. Land in Farms for New York, Selected Census Years, 1950-1997



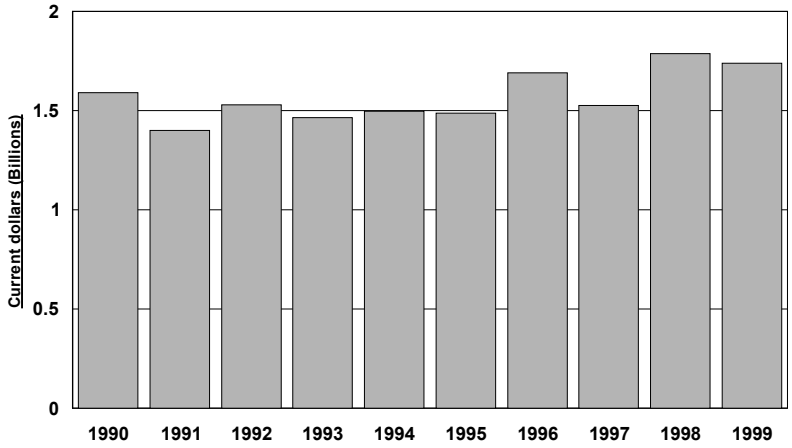
Source: US Dept. of Commerce. See Appendix Table A-1 for data.

Figure 15. Cash Receipts from Farm Marketings, New York, 1977-1996



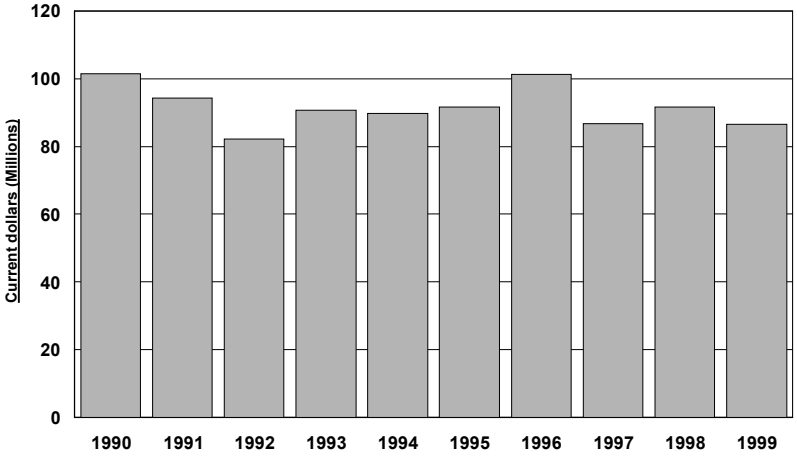
Source: US Dept. Commerce, Bureau of Economic Analysis. See Appendix Table A-2 for data.

Figure 16. Cash Receipts from Farm Marketings: Dairy Products, New York, 1990-1999



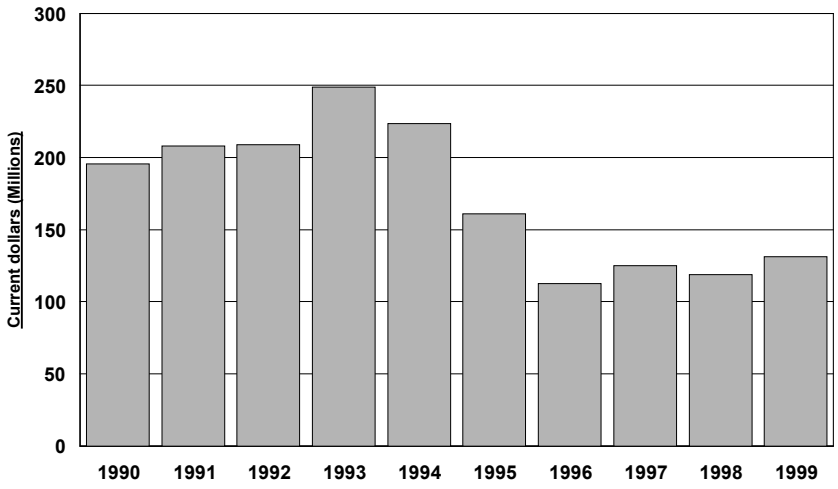
Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

Figure 17. Cash Receipts from Farm Marketings: Poultry and Eggs, New York, 1990-1999



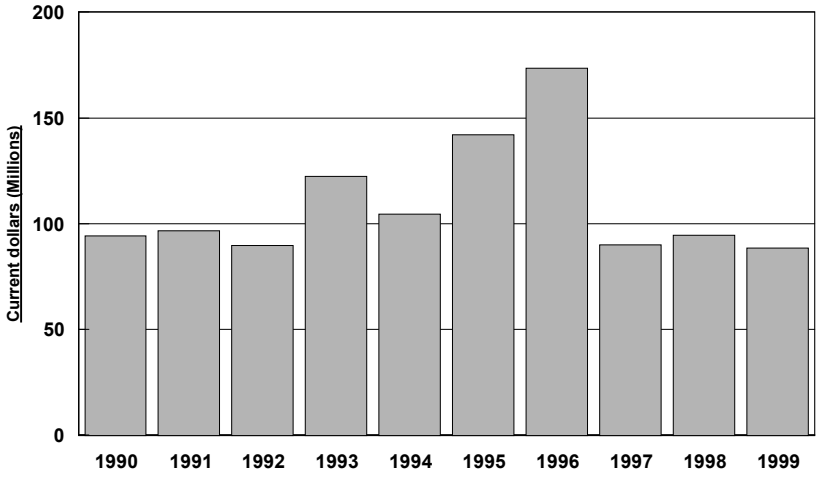
Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

Figure 18. Cash Receipts from Farm Marketings: Meat Animals, New York, 1990-1999



Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

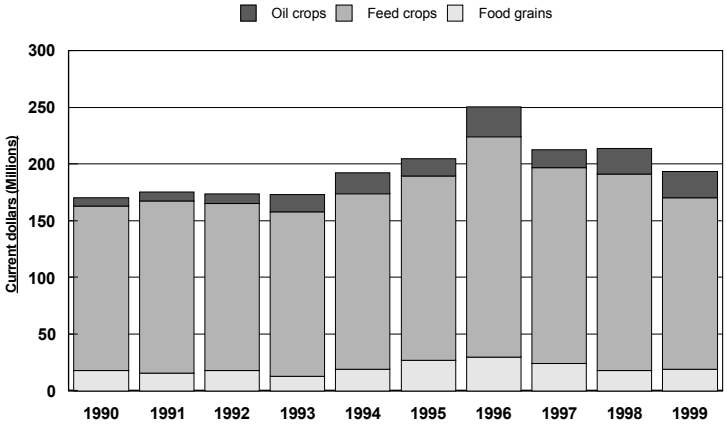
Figure 19. Cash Receipts from Farm Marketings: Miscellaneous Livestock, New York, 1990-1999



Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

Much of New York's crop acreage is used to produce feed and forage crops to support the livestock industries mentioned above. Hay crops are the largest block of New York crop acreage, but many New York farmers sell crops to generate cash for the farm business. Receipts from the sale of oil seed crops (almost entirely soybeans), field grains (corn primarily), and food grains (wheat primarily) are shown in Figure 20. In 1999 cash receipts from this source totaled more than $193 million, down from a peak of $250 million in 1996. The 1996 crop year was noteworthy for crop farmers because of favorable prices for several field crops. Because of similar yield and price interactions, cash receipts from the sale of fruit crops ranged between $193 and $211 million during the late 1990s. In 1999, cash receipts from sales of all fruit crops approached $209 million (Figure 21). New York also has a vibrant vegetable crops industry. Cash receipts from the sale of vegetable crops were as high as $356 million in the late 1990s (Figure 22). Sales of greenhouse and nursery products have ramped up in recent years, and in 1999 receipts from this source exceeded $275 million (Figure 23).

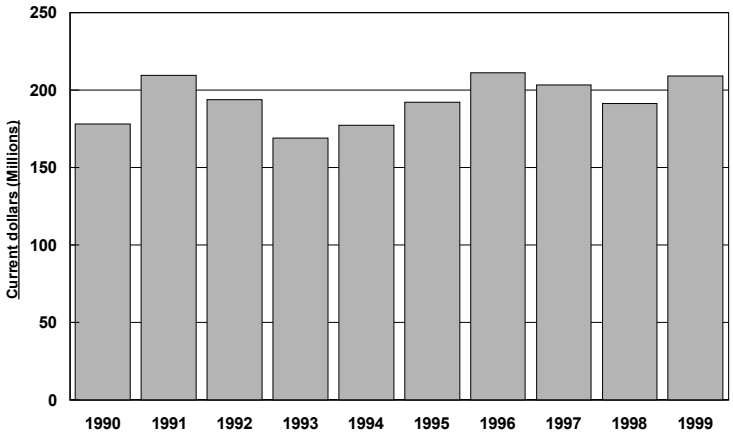
Figure 20. Cash Receipts from Farm Marketings: Oil, Feed, and Grains, New York, 1990-1999



Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

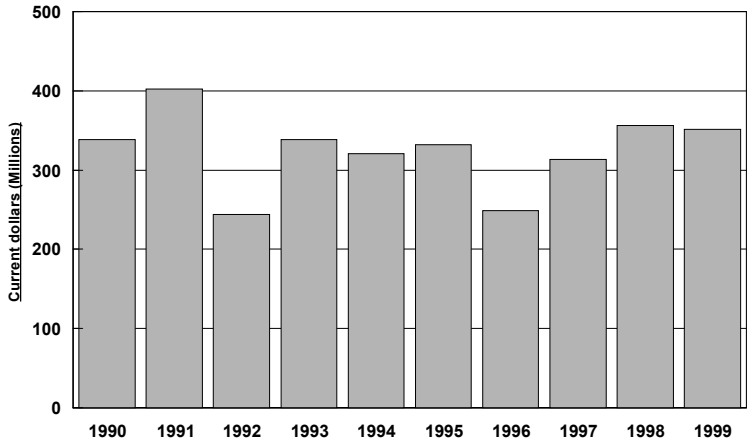
Movement beyond production agriculture to a review of trends for all key farm and food sectors shifts attention to agricultural services and food manufacturing. These sectors, along with commodity production, account for gross output estimated at about $23 billion in 1996. An effort is made to give the trend information the context needed to make comparisons in two key dimensions: between sectors and between competitor states. The sectoral comparisons center upon year-to-year movements in farm and food production during the 21-year interval 1977-98. These years were largely dictated by data availability. Then, for each year in the interval, farm and food production was assessed using three alternate units of measure: employment, earnings, and value added. Each unit of measure is

Figure 21. Cash Receipts from Farm Marketings: Fruit Crops, New York, 1990-1999



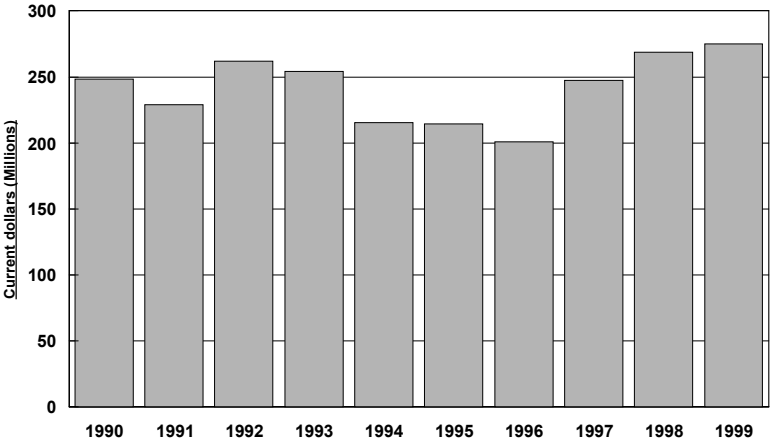
Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

Figure 22. Cash Receipts from Farm Marketings: Vegetable Crops, New York, 1990-1999



Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

Figure 23. Cash Receipts from Farm Marketings: Greenhouse and Nursery Crops, New York, 1990-1999



Source: US Dept. of Agriculture, Economic Research Service. See Appendix Table E-1 for data.

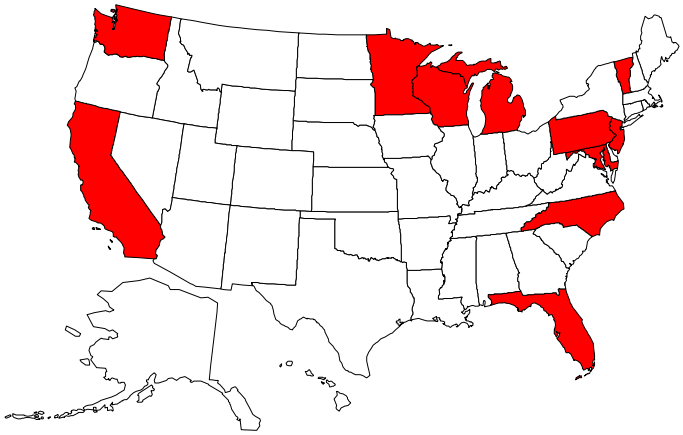
applied to the U.S., New York, and to 11 states deemed to be good reference points for New York food and agriculture because they are thought to be similarly positioned in major farm commodity markets. See Figure 24 for a graphic representation of the 11 competitor states identified by the New York State Department of Agriculture and Markets.

The time series data are shown in Appendix Tables A-D and some of the salient trends are briefly summarized in this section. Turning first to employment, Figure 25 shows year-to-year levels of employment in farm, agricultural services, and food manufacturing, respectively, over the 1977-98 span. Farm employment, during a period of rapid increases in labor productivity and growth in average farm size, decreased from nearly 100,000 jobs to about 59,500 jobs. These jobs are measured in Federal statistics after taking into account production by nearly 60 different types of farm businesses (see Box 9). Data protocols used in Federal statistics make employment counts inclusive of both full-time and part-time employees. Labor use in farming is relatively difficult to measure because of dependence on family labor, use of seasonal workers in some commodity areas, and the predominance of smaller, part-time farms. Published data estimates do not distinguish between full and part-time work, nor is the seasonality of some farm employment taken into account.[6]

Interestingly, job making in agricultural services over the last two decades has increased fairly dramatically. As a result, industries de-

[6] While these data problems are substantial for farming, all of them are probably endemic and plague our efforts to understand job making in small businesses outside the farm sector as well. Clearly, similar problems can prevail in the service sectors where businesses often operate on a small scale and/or provide numerous jobs on a part-time basis.

Figure 24. Eleven of New York's Competitor States



fined as agricultural services result in the same proximate number of jobs as those found in direct crop and livestock production. For the reference year 1998, agricultural services employment is estimated at just over 59,000 jobs, more than a two-fold increase over the employment figure estimated in 1977 (Figure 25). Such abrupt employment expansion would appear to be anomalous at first glance but comes into sharper focus when the classification of agricultural service establishments is understood. The Federal definition of agricultural services is probably at odds with the common perception of the services afforded farm operators. That perception usually turns on firms that supply farm inputs -- feed, livestock, seed, fertilizer, and the like -- and/or transport and process raw farm commodities. However, very little of these lines of activity make their way into the category "agricultural services" in published data series.

Rather, this service category relates to production agriculture in only a limited way. While inclusive of such farm services as soil preparation, custom crop harvesting, crop preparation services for marketing, and veterinary services for livestock, the agricultural services category largely deals with several nonfarm lines of economic activity. Along with farm animals and to a much larger extent, veterinary services extend to a variety of companion animals. Similarly, other companion animal services such as animal boarding or kennels are included in this sector. Another major area encompassed by agricultural services is activity related to New York's green industries, including landscape, lawn and garden services, ornamentals, and trees. Lastly, agricultural services are inclusive of a variety of establishments purveying services for the forestry and fisheries sectors (Box 6).

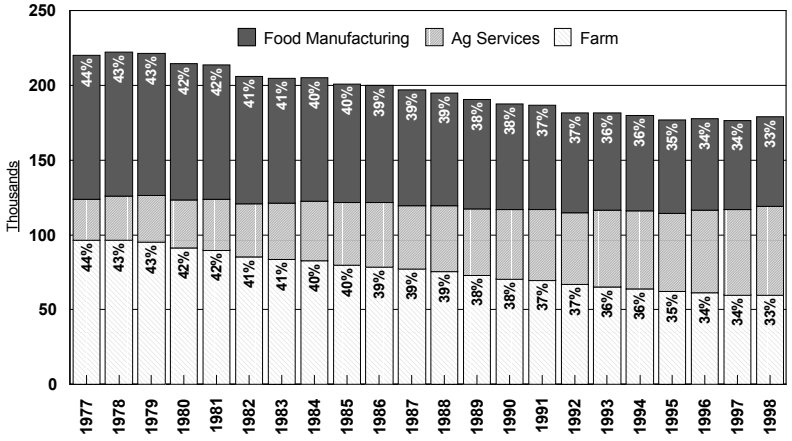
Employment in food manufacturing does not show employment increases but mirrors the steady job losses that characterized production agriculture throughout the 1977-98 interval (Figure 25). As with farm and agricultural services employment, food manufacturing accounts for over 59,000 jobs,

Box 9. Establishments classified as farms

- Wheat
- Rice
- Corn
- Soybeans
- Dry Pea and Bean Farms
- Cotton
- Tobacco
- Sugar Beets
- Sugarcane
- Irish Potatoes
- Field Crops, Except Cash Grains, NEC
- Hay Farms
- Peanut Farming
- Other Field Crop Farms
- Vegetables and Melons
- Strawberry Farms
- Other Berry Farms
- Grapes
- Tree Nuts
- Orange Groves and Farms
- Other Citrus Groves and Farms
- Apple Orchards and Farms
- Combination Fruit and Tree Nut Farms
- Floriculture Farming
- Nursery Farming
- Mushrooms
- Beef Cattle Feedlots
- Beef Cattle, Except Feedlots
- Hogs
- Sheep Farms
- Goat Farms
- General Livestock, Except Dairy and Poultry
- Dairy Heifer Replacement Farms
- Dairy Farms
- Broiler, Fryers, and Roaster Chickens
- Chicken Eggs
- Turkey and Turkey Eggs
- Poultry Hatcheries
- Fur-Bearing Animals and Rabbits
- Horses and Other Equines
- Finfish Farms
- Shellfish Farms
- Alligator and Frog Production
- Bee Farms
- General Farms, Primarily Livestock and Animal Specialties

Source: US Bureau of the Census

Figure 25. Food and Agriculture Employment, New York, 1977-1998



Source: US Dept. of Commerce, Bureau of Economic Analysis.

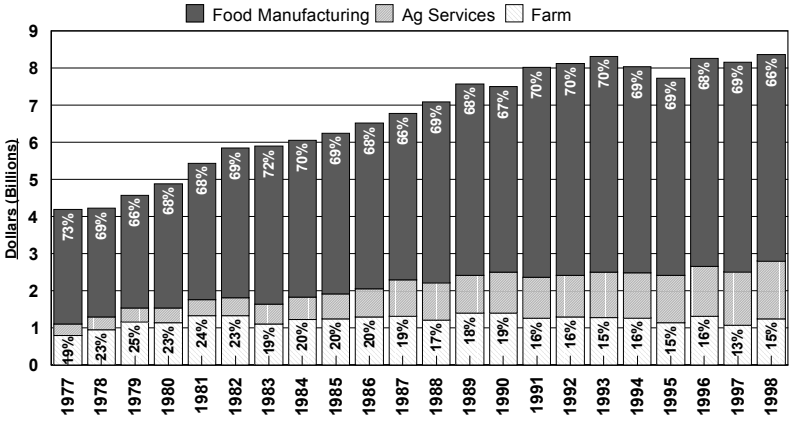
down from more than 96,000 jobs in the mid-1970s. Food manufacturing by necessity is a very diverse collection of establishments involved in all phases of food processing and packaging. The broad category "food manufacturing" not only includes processing of food and beverages for human consumption, but also extends to the production of mixed and blended animal feeds and pet foods (see Box 6).

Moving away from employment as a unit of measure provides a distinctly different impression of trend in some cases. A useful measure is value added, the remaining component of total output after cash business expenses have been accounted for in any single industrial sector (see Box 4). Value added originating in farming, in sharp contrast to farm employment, has remained relatively stable and exhibits a slight upward trend in current dollar terms over the last two decades. In 1996, value added in the New York farm sector was about $1.2 billion (Figure 26).

Value added in agricultural services, as one might expect, closely mirrors movements in employment. This is so because service sectors by definition are marked by high levels of labor input and are subject to relatively low rates of incremental change in labor productivity. For these reasons, employment and value added, dominated in this case by payments for labor services, are closely correlated as evidenced in Figures 25 and 26. Interestingly, by the close of the 1990 decade, value added in agricultural services actually exceeded the value added in production agriculture. This suggests that, like the larger macro economy, New York food and agriculture is becoming a service-based set of industries.

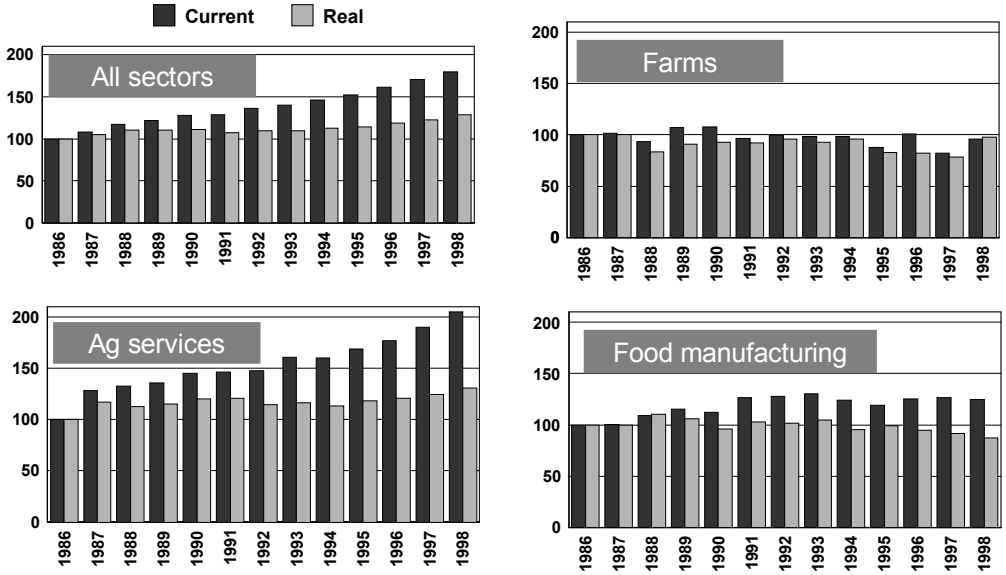
Value added in food manufacturing, on the other hand, has moved in directions counter to movements in employment over the past two decades. These countermovements are expected because of sharp increases in labor productivity over time. As Figure 26 shows, value added in food manufacturing has increased precipitously since the mid-1970s and presently stands at about $5.5 billion, up from just over $3 billion in 1977.

Figure 26. Valued Added Originating in Food and Agriculture, New York, 1977-1998



Source: US Dept. of Commerce, Bureau of Economic Analysis.

Figure 27. Index (1986=100) of Current and Real Value Added, New York, 1986-1998

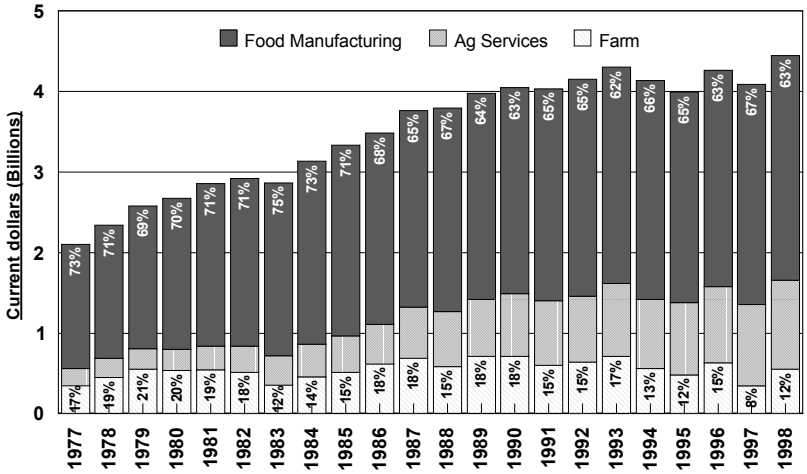


Source: US Dept. of Commerce, Bureau of Economic Analysis.

Taken together, the gross state product originating in New York food and agriculture has increased dramatically during the last two decades. In current dollar terms, the value added in these three sectors has increased from more than $4 billion per year to more than $8 billion over the 20-year interval (Figure 26). These value added increases reflect movements in both quantity produced and relative prices. Separating these price and quantity effects is of interest, and such data are now generated by the U.S. Department of Commerce. Results for the New York situation are shown in Figure 27 for calendar years 1986-98. Calculations of current and real value added for the entire state economy and for farm, ag service, and food manufacturing sectors have been indexed to calendar year 1986 as a base year. This procedure allows one to compare movements in percentage terms, in value added terms, and in both real and current dollar terms. The results show that the New York macro economy realized a 29 percent real increase in value added production over the 1986-98 interval (Figure 26). In real terms, value added in New York's ag services sector increased at rates comparable to the average for all industries, with a percentage increase of 30 percent between 1986 and 1999. In contrast, real value added in the New York farm sector fell below the 1986 base year throughout the late 1980s and 1990s. Real farm value added rebounded slightly in the late 1990s and presently stands at about 97 percent of the 1986 level. Real value added in food manufacturing displays little trend between 1986 and the mid-1990s. However, value added in food manufacturing has fallen in recent years and registered an index value of 90 percent in 1998 (Figure 26).

Additional insight on recent trends can be gained by measuring movements in earnings (personal income) generated in farming, agricultural services, and food manufacturing. According to Federal statistics, production agriculture generates earnings in the range of about $500 million (Figure 28). As expected, earnings in farming are highly erratic with often-abrupt year-to-year changes triggered by fluctuations in commodity prices and/or the vagaries of weather. Farm proprietors absorb most of the volatility in farm earnings. Earnings include payments to hired farm labor, but proprietor's earnings are a relatively large proportion of the total and move with increases and decreases in net farm income. In contrast, earnings originating in agricultural services have systematically increased (Figure 28). Presently, agricultural services generate about $1.1 billion in earnings, an amount significantly above that generated by production agriculture.

Figure 28. Employee Compensation (Earnings) Originating in Food and Agriculture, New York, 1977-1998



Source: US Dept. of Commerce, Bureau of Economic Analysis.

Like ag services, earnings in food manufacturing have increased systematically, but in the face of declining employment for the last two decades. In 1998, food manufacturing earnings stood at about $2.8 billion, an amount nearly six times the amount realized from crop and livestock production (Figure 28).

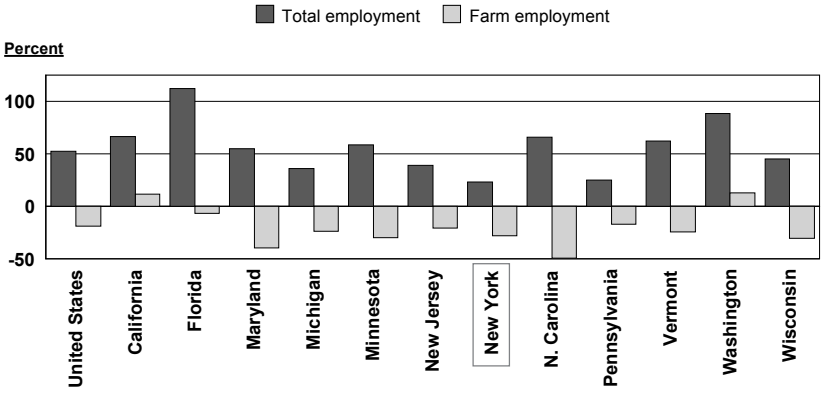
Trends in an Interstate Context

A reasonable question at this juncture is: So what? Are long-term secular trends observed in New York an aberration, or are they essentially in line with developments elsewhere in the nation? To place these trends in sharper perspective, comparisons are made with the national trend and with the states thought to be significant competitors with New York farmers in national and international commodity markets.

Turning first to employment on farms, it should be noted that, in percentage terms, the 1977-98 decrease in farm employment was approximately in line with the U.S. average. For the nation as a whole, farm employment fell from about 3.9 million jobs to 3.1 million jobs over this two-decade span, a decrease of about 19 percent (Figure 29), while total employment increased by more than 50 percent. With the exception of California and Washington, all states included in this study exhibit similar farm employment trends. California and Washington registered an increase in farm employment of 11 and 13 percent, respectively, between 1977 and 1998. New York's sluggish macro economy is clearly evidenced in these employment data. Total employment in New York State grew by a very modest 23 percent over the 21-year interval as New York registered low population growth and high rates of net outmigration at the state level.

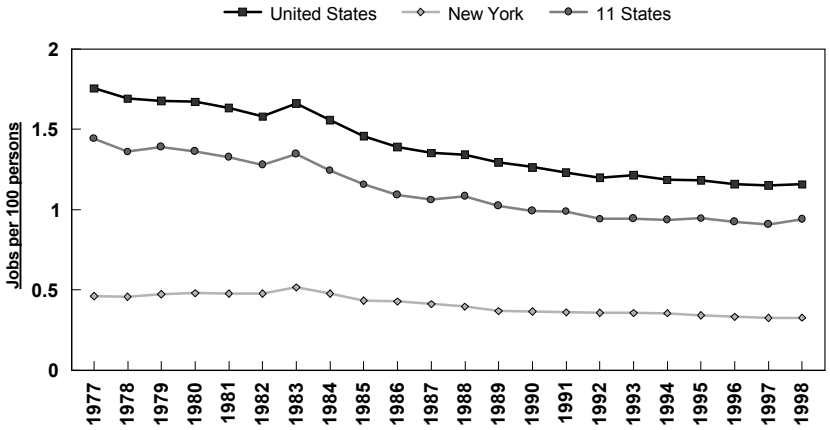
Taking population into account and averaging employment/population ratios for the 11 comparison states results in a useful comparison of trend on a

Figure 29. Change in Farm Employment, New York, 11 Competitor States and the US, 1977-1998



Source: US Dept. Commerce, Bureau of Economic Analysis.

Figure 30. Farm Employment Per 100 Population for New York, 11 Competitor States, and the US, 1977-1998



Source: US Dept. Commerce, Bureau of Economic Analysis.

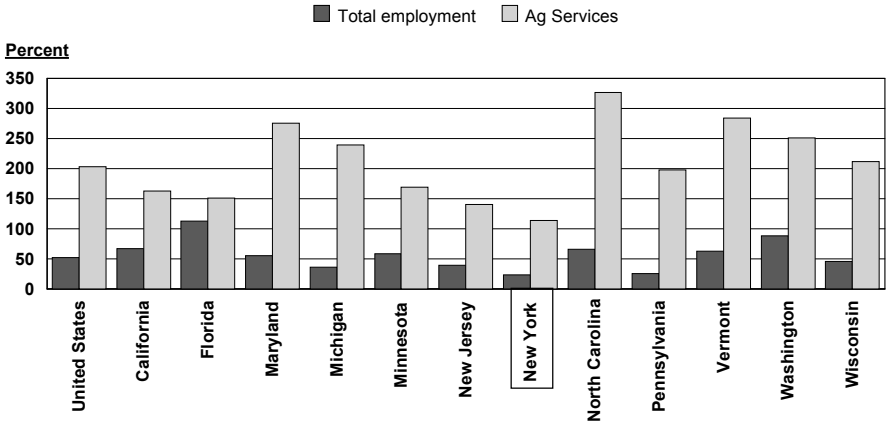
yearly basis since 1977 (see Figure 30). A striking difference between New York, the nation, and competitor states is evidenced in employment/population ratios. Nationally, farm employment per 100 persons decreased systematically from 1.8 to 1.2 over this period, on average. Almost identical rates of change occurred among New York's competitor states, although relatively smaller shares of the total population were engaged in farming. New York's level of engagement as reflected in employment/population ratios is markedly lower than any of these cases and ranged between 0.5 and 0.33 between 1977 in 1998.

As noted above, New York registered very sizable increases in agricultural services employment over the last two decades. However, it can be seen that these increases are far less dramatic in a national and regional context (Figures 31 and 32). Although impressive in absolute terms, New York realized one of the nation's more modest employment gains in these aggregate sectors. Nationally, the percentage increase was over 200 percent over this interval, compared with 113 percent in New York. Percentage gains were uniformly higher in competitor states, with percentage increases approaching or exceeding 250 percent in several states, capped by North Carolina's impressive 326 percent gain (Figure 31).

Some of these percentage increases, of course, were made from fairly small employment bases. Adjusting for population, as in Figure 32, sheds much additional light on agricultural services employment and shows that New York's competitor states, on average, moved in accordance with the national trend. New York, however, realized a breakaway in the early 1980s, and employment increases have been relatively modest in agricultural services since that time.

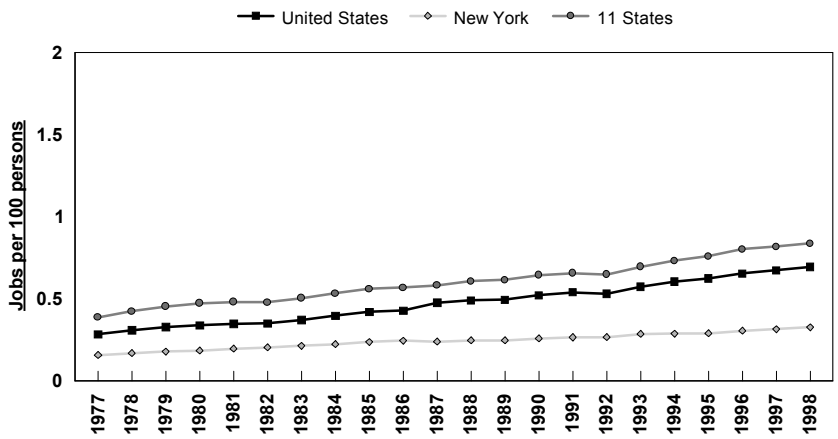
Patterns are much the same for food manufacturing, with New York realizing the largest percentage decrease in food manufacturing employment among the

Figure 31. Change in Ag Services Employment, US and Selected States, 1977-1998



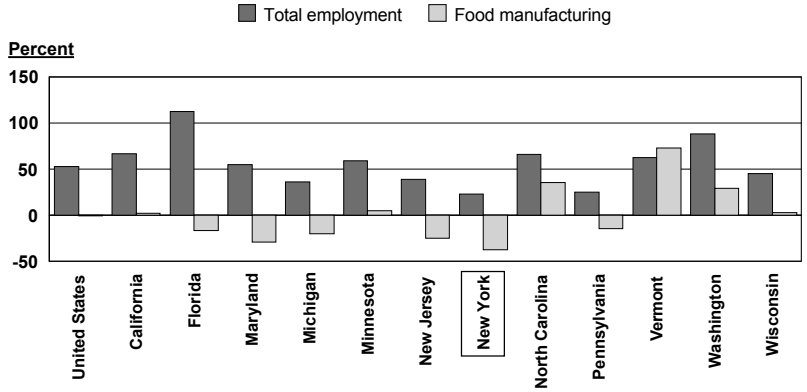
Source: US Dept. Commerce, Bureau of Economic Analysis.

Figure 32. Ag Services Employment Per 100 Population for New York, 11 Competitor States, and the US, 1977-1998



Source: US Dept. Commerce, Bureau of Economic Analysis.

Figure 33. Change in Food Manufacturing Employment, New York, 11 Competitor States, and the US, 1977-1998

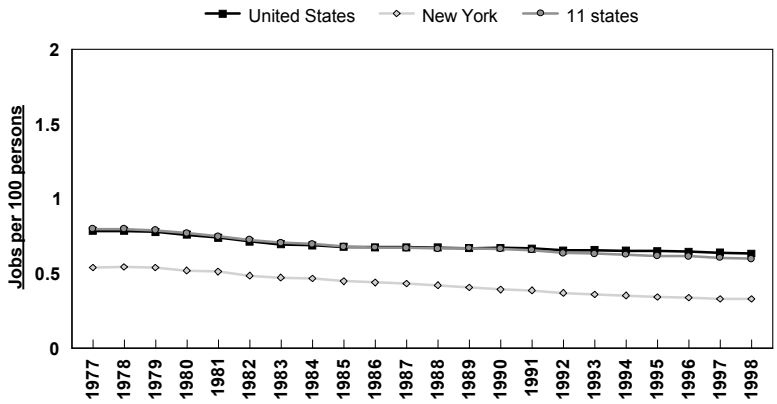


Source: US Dept. Commerce, Bureau of Economic Analysis.

states included in this summary (Figure 33). Nationally, food manufacturing has not been a vibrant source of employment, with jobs hovering in the range of 1.7 million since the mid-1970s. This stable employment in the face of population increases has reduced the incidence of food manufacturing employment from about 0.8 per 100 persons to 0.6 (Figure 34). This general relationship holds in each of New York's competitor states and, on average, employment per 100 persons has moved in virtual locked step with movements at the national level. New York has evidenced similar patterns, but again with relatively low employment concentration in food manufacturing (see Figure 34).

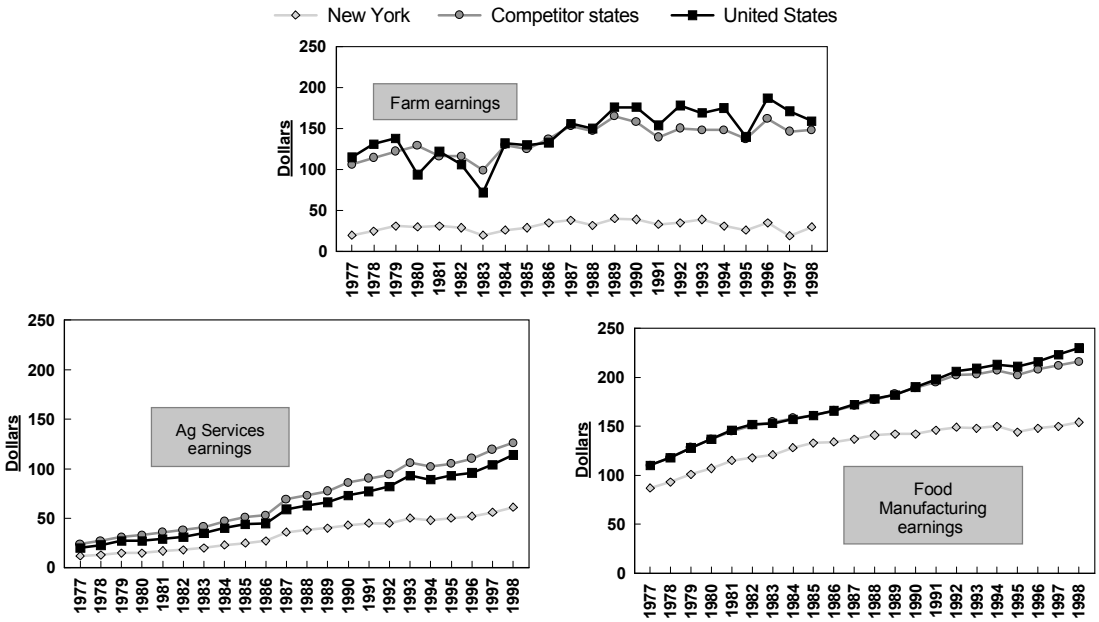
A somewhat similar pattern emerges when attention turns to measures based on state gross product or earnings, as shown in Figures 35 and 36. Per capita value added (gross state product) and earnings both show that New York lags behind the nation and competitor states. While both product and earnings have increased in New York over the recent past, rates of change have stagnated, beginning in the early 1980s, with no recovery evidenced in the data.

Figure 34. Food Manufacturing Employment Per 100 Population for New York, 11 Competitor States, and the US, 1977-1998



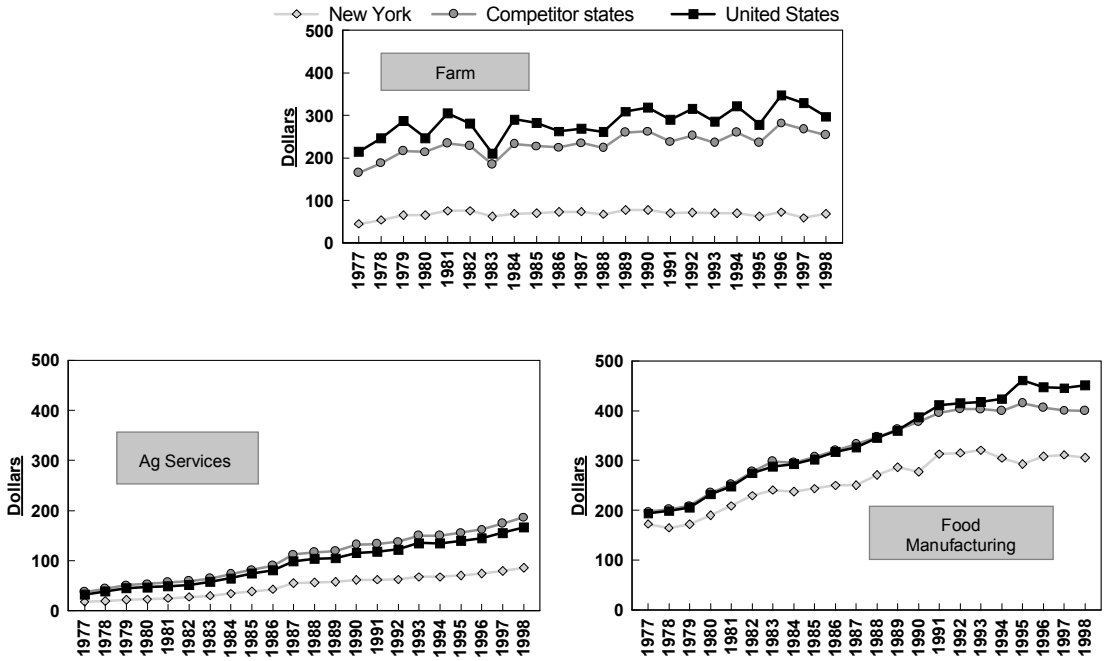
Source: US Dept. Commerce, Bureau of Economic Analysis.

Figure 35. Per Capita Employee Compensation (Earnings) for Farms, Ag Services, and Food Manufacturing, 1977-1998



Source: US Dept. Commerce, Bureau of Economic Analysis.

Figure 36. Per Capita Value Added, 1977-1998



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APPENDIX A

Farms, Land in Farms and Farm Income/Expense Data

Table A-1. Farms and Land in Farms, New York, Selected Census Years, 1950-97

Census year	*No. of farms*	*Land in farms*	
		Crop and pasture land	*Support land*
	(1,000)	*--- (Million acres)---*	
1950	124.8	8.5	7.5
1959	82.4	7.1	6.4
1969	51.9	6.1	4.0
1978	43.1	5.9	3.6
1987	37.7	5.4	3.0
1992	32.3	4.9	2.6
1997	31.8	4.7	2.5

Source: US Census Bureau and the US Department of Agriculture.

Table A-2. Farm Income and Expenses, New York, 1977-96

	1977	1978	1979	1980	1981	1982	1983
				--- (Thous. dollars) ---			
Total cash receipts from marketings	1,785,724	1,998,783	2,377,212	2,589,883	2,782,007	2,644,997	2,689,312
Cash receipts: livestock and products	1,274,846	1,432,561	1,749,477	1,892,612	1,987,541	1,935,686	2,003,799
Cash receipts: crops	510,878	566,222	627,735	697,271	794,466	709,311	685,513
Other income	156,890	169,487	168,836	164,099	168,629	190,319	215,966
Government payments	8,576	22,475	9,036	5,821	6,910	13,767	38,995
Imputed and miscellaneous income received	148,314	147,012	159,800	158,278	161,719	176,552	176,971
Total production expenses	1,775,774	1,919,665	2,286,672	2,527,390	2,721,364	2,669,052	2,767,264
Feed purchased	372,544	379,209	442,681	518,978	545,964	444,460	504,178
Livestock purchased	83,222	98,389	158,273	135,762	131,968	95,487	91,656
Seed purchased	54,574	54,662	58,080	62,146	63,761	56,883	48,032
Fertilizer & lime	113,382	133,506	164,352	186,515	188,665	179,640	170,320
Petroleum products purchased	86,002	91,554	109,475	149,838	160,100	140,503	130,102
Hired farm labor expenses	237,419	230,314	255,380	265,275	261,422	294,336	284,566
All other production expenses	828,631	932,031	1,098,431	1,208,876	1,369,484	1,457,743	1,538,410
Total value of inventory change	(29,509)	8,473	84,712	62,163	91,300	80,910	(43,378)
Value of inventory change: livestock	(37,539)	(24,195)	56,603	44,206	96,950	39,358	13,626
Value of inventory change: crops	8,030	32,668	28,109	17,957	(5,650)	41,552	(57,004)
Derivation of farm labor and proprietors' income							
Total cash receipts and other income	1,942,614	2,168,270	2,546,048	2,753,982	2,950,636	2,835,316	2,905,278
Less: Total production expenses	1,775,774	1,919,665	2,286,672	2,527,390	2,721,364	2,669,052	2,767,264
Realized net income	166,840	248,605	259,376	226,592	229,272	166,264	138,014
Plus: Value of inventory change	(29,509)	8,473	84,712	62,163	91,300	80,910	(43,378)
Total net income including corporate farms	137,331	257,078	344,088	288,755	320,572	247,174	94,636
Less: Net income of corporate farms	6,827	18,635	25,227 (L)		17,434	1,629	(9,632)
Plus: Statistical adjustment	--	(L)	(L)	--	(L)	--	(L)
Total net farm proprietors' income	130,504	238,442	318,860	288,771	303,146	245,545	104,260
Plus: Farm wages and perquisites	199,487	194,609	216,055	228,136	225,946	260,145	247,443
Plus: Farm other labor income	18,170	17,303	14,598	16,530	14,260	12,656	11,315
Total farm labor and proprietors' income	348,161	450,354	549,513	533,437	543,352	518,346	363,018

--continued--

Table A-2. Farm Income and Expenses, New York, 1977-96 (continued)

	1984	1985	1986	1987	1988	1989	1990
				--- (Thous. dollars) ---			
Total cash receipts from marketings	2,751,435	2,618,286	2,627,827	2,712,590	2,751,743	2,952,794	3,024,040
Cash receipts: livestock and products	1,994,313	1,907,659	1,860,672	1,877,342	1,849,059	2,015,157	2,082,119
Cash receipts: crops	757,122	710,627	767,155	835,248	902,684	937,637	941,921
Other income	236,639	219,689	250,667	277,489	251,766	244,763	232,624
Government payments	63,690	43,117	76,690	109,304	86,787	76,027	59,304
Imputed and miscellaneous income received	172,949	176,572	173,977	168,185	164,979	168,736	173,320
Total production expenses	2,745,392	2,518,690	2,425,424	2,444,583	2,501,982	2,715,471	2,867,353
Feed purchased	445,027	398,866	399,258	371,865	392,134	442,138	445,787
Livestock purchased	86,923	68,366	73,412	98,770	78,904	109,809	118,161
Seed purchased	60,190	55,359	56,160	57,155	70,732	76,083	77,617
Fertilizer & lime	188,998	172,966	154,677	155,355	154,220	172,576	177,209
Petroleum products purchased	131,133	114,965	93,721	86,968	84,308	84,171	103,533
Hired farm labor expenses	294,494	302,176	278,125	285,708	318,446	346,089	401,345
All other production expenses	1,538,627	1,405,992	1,370,071	1,388,762	1,403,238	1,484,605	1,543,701
Total value of inventory change	(29,178)	(39,181)	(43,600)	(56,633)	(164,739)	(8,713)	23,521
Value of inventory change: livestock	(26,370)	(65,668)	(50,360)	(50,376)	(80,675)	(5,480)	5,778
Value of inventory change: crops	(2,808)	26,487	6,760	(6,257)	(84,064)	(3,233)	17,743
Derivation of farm labor and proprietors' income							
Total cash receipts and other income	2,988,074	2,837,975	2,878,494	2,990,079	3,003,509	3,197,557	3,256,664
Less: Total production expenses	2,745,392	2,518,690	2,425,424	2,444,583	2,501,982	2,715,471	2,867,353
Realized net income	242,682	319,285	453,070	545,496	501,527	482,086	389,311
Plus: Value of inventory change	(29,178)	(39,181)	(43,600)	(56,633)	(164,739)	(8,713)	23,521
Total net income including corporate farms	213,504	280,104	409,470	488,863	336,788	473,373	412,832
Less: Net income of corporate farms	9,345	16,240	20,913	28,456	14,076	43,109	38,556
Plus: Statistical adjustment	(L)	--	(L)	(L)	(L)	(L)	(L)
Total net farm proprietors' income	204,162	263,864	388,566	460,401	322,713	430,270	374,275
Plus: Farm wages and perquisites	243,609	243,762	224,207	221,913	253,064	268,627	315,603
Plus: Farm other labor income	11,774	12,483	12,915	11,435	12,257	16,646	20,626
Total farm labor and proprietors' income	459,545	520,109	625,688	693,749	588,034	715,543	710,504

--continued--

Table A-2. Farm Income and Expenses, New York, 1977-96 (continued)

	1991	1992	1993	1994	1995	1996
			--- (Thous. dollars) ---			
Total cash receipts from marketings	2,924,774	2,950,117	2,965,648	2,951,856	2,944,361	3,104,741
Cash receipts: livestock and products	1,898,395	1,999,636	2,004,012	1,972,515	1,931,908	2,103,980
Cash receipts: crops	1,026,379	950,481	961,636	979,341	1,012,453	1,000,761
Other income	218,734	238,292	269,973	241,078	235,799	217,910
Government payments	41,242	47,872	72,286	42,417	43,481	43,289
Imputed and miscellaneous income received	177,492	190,420	197,687	198,661	192,318	174,621
Total production expenses	2,846,036	2,815,271	2,867,099	3,006,902	3,153,986	3,184,968
Feed purchased	437,202	438,356	431,550	411,925	447,270	478,799
Livestock purchased	115,615	113,243	122,841	98,972	94,872	75,502
Seed purchased	87,241	71,555	71,814	82,014	95,251	110,044
Fertilizer & lime	191,495	175,049	154,582	178,381	200,199	186,368
Petroleum products purchased	100,387	92,355	95,054	95,294	105,767	113,119
Hired farm labor expenses	394,745	382,325	425,754	436,288	491,889	509,420
All other production expenses	1,519,351	1,542,388	1,565,504	1,704,028	1,718,738	1,711,716
Total value of inventory change	(13,998)	(30,558)	(45,017)	24,234	(29,081)	20,521
Value of inventory change: livestock	5,917	1,068	(17,197)	(34,411)	21,987	21,021
Value of inventory change: crops	(19,915)	(31,626)	(27,820)	58,645	(51,068)	(500)
Derivation of farm labor and proprietors' income						
Total cash receipts and other income	3,143,508	3,188,409	3,235,621	3,192,934	3,180,160	3,322,651
Less: Total production expenses	2,846,036	2,815,271	2,867,099	3,006,902	3,153,986	3,184,968
Realized net income	297,472	373,138	368,522	186,032	26,174	137,683
Plus: Value of inventory change	(13,998)	(30,558)	(45,017)	24,234	(29,081)	20,521
Total net income including corporate farms	283,474	342,580	323,505	210,266	(2,907)	158,204
Less: Net income of corporate farms	20,450	34,290	12,935	33,241	(960)	23,163
Plus: Statistical adjustment	(L)	--	(L)	(L)	(L)	(L)
Total net farm proprietors' income	263,025	308,290	310,575	177,033	(1,949)	135,042
Plus: Farm wages and perquisites	307,030	299,928	316,153	318,620	361,320	378,965
Plus: Farm other labor income	24,210	22,572	25,318	26,265	28,450	27,274
Total farm labor and proprietors' income	594,265	630,790	652,046	521,918	387,821	541,281

L=Less than $100.
Source: US Dept. Commerce, Bureau of Economic Analysis, File CA45 -- New York.

APPENDIX B

Employment Data

Table B-1. Employment Originating in Farming for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total jobs ---					
US	3,857,000	3,756,000	3,764,000	3,798,000	3,750,000	3,657,000	3,880,000	3,669,000	3,466,000	3,335,000	3,275,000
California	303,489	268,712	292,551	281,335	275,947	269,222	289,705	268,642	253,934	244,287	247,224
Florida	97,857	102,335	105,049	105,654	101,895	98,486	105,850	98,723	89,285	89,853	88,339
Maryland	29,082	28,992	29,049	29,605	30,045	29,480	31,545	29,838	26,653	26,198	25,560
Michigan	94,984	93,045	95,244	97,408	97,696	96,231	102,917	97,626	94,491	89,386	87,713
Minnesota	142,213	143,151	136,577	137,995	134,220	132,866	140,535	130,727	134,254	126,800	125,128
New Jersey	20,699	19,708	19,297	20,103	20,125	19,337	20,732	19,297	17,488	17,714	17,781
New York	82,362	81,247	83,372	84,459	83,931	84,137	91,275	84,683	77,426	76,429	73,825
North Carolina	171,799	155,516	163,608	150,719	155,627	146,749	153,717	141,829	126,245	112,290	104,520
Pennsylvania	97,268	90,235	88,471	97,698	92,720	90,704	96,106	91,094	90,639	90,151	90,308
Vermont	12,415	13,121	13,229	14,334	14,308	13,467	14,462	13,511	11,083	10,948	10,739
Washington	72,759	73,666	80,445	81,180	83,967	81,873	87,012	81,800	75,662	74,030	74,115
Wisconsin	145,687	145,298	150,588	150,849	143,358	141,868	149,475	140,712	129,653	123,367	121,490
11 States	1,188,252	1,133,779	1,174,108	1,166,880	1,149,908	1,120,283	1,192,056	1,113,799	1,049,387	1,005,024	992,917
						--- Per 100 persons ---					
US	1.755	1.691	1.676	1.671	1.634	1.579	1.660	1.556	1.457	1.389	1.352
California	1.358	1.177	1.258	1.182	1.136	1.085	1.142	1.039	0.960	0.901	0.890
Florida	1.101	1.121	1.109	1.074	1.000	0.941	0.985	0.894	0.787	0.770	0.736
Maryland	0.693	0.688	0.688	0.700	0.705	0.688	0.731	0.684	0.604	0.584	0.560
Michigan	1.037	1.011	1.030	1.052	1.061	1.056	1.137	1.079	1.041	0.979	0.955
Minnesota	3.573	3.575	3.382	3.378	3.264	3.216	3.393	3.144	3.209	3.015	2.955
New Jersey	0.282	0.268	0.262	0.273	0.272	0.260	0.278	0.257	0.231	0.232	0.232
New York	0.461	0.458	0.473	0.481	0.478	0.478	0.516	0.477	0.435	0.429	0.413
North Carolina	3.031	2.709	2.820	2.555	2.613	2.438	2.529	2.301	2.019	1.776	1.632
Pennsylvania	0.819	0.761	0.745	0.823	0.782	0.766	0.812	0.771	0.770	0.765	0.765
Vermont	2.522	2.633	2.616	2.797	2.775	2.594	2.764	2.565	2.091	2.050	1.988
Washington	1.929	1.896	2.005	1.954	1.982	1.914	2.023	1.883	1.720	1.663	1.635
Wisconsin	3.158	3.137	3.227	3.201	3.033	3.000	3.166	2.971	2.731	2.594	2.543
11 States	1.443	1.360	1.390	1.361	1.325	1.278	1.346	1.244	1.157	1.092	1.062

-- continued --

Table B-1. Employment Originating in Farming for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total jobs ---					
US	3,281,000	3,200,000	3,153,000	3,104,000	3,057,000	3,130,000	3,084,000	3,106,000	3,073,000	3,086,000	3,127,000
California	270,048	275,146	262,166	272,316	254,331	272,131	264,705	284,288	292,128	277,818	339,599
Florida	99,860	95,099	92,306	92,493	95,749	98,822	101,412	94,489	88,995	93,719	91,719
Maryland	24,881	22,984	22,129	22,465	22,477	20,637	20,156	19,957	19,123	19,328	17,632
Michigan	86,584	81,221	82,122	82,625	80,012	79,083	80,035	80,191	75,928	74,582	72,487
Minnesota	123,553	116,674	116,289	114,546	111,550	107,989	107,262	106,250	102,367	101,593	100,144
New Jersey	17,731	16,179	15,710	16,508	16,936	16,064	16,397	16,713	16,715	18,223	16,413
New York	71,290	66,351	65,891	65,037	64,777	64,673	64,579	62,261	60,438	59,302	59,556
North Carolina	105,318	95,336	95,576	98,421	96,801	92,578	90,432	95,635	88,945	91,562	87,409
Pennsylvania	89,038	82,824	80,451	81,297	79,878	80,292	81,175	82,022	80,842	84,924	80,959
Vermont	10,447	9,716	9,617	9,466	9,437	9,424	9,463	9,316	9,233	9,264	9,424
Washington	80,255	78,836	81,399	79,295	70,240	73,813	77,698	80,137	84,413	82,774	82,174
Wisconsin	121,341	114,330	114,701	113,370	109,712	108,198	108,871	108,795	103,689	103,170	101,293
11 States	1,029,056	988,345	972,466	982,802	947,123	959,031	957,606	977,793	962,378	956,957	999,253
						--- Per 100 persons) ---					
US	1.342	1.296	1.264	1.231	1.199	1.214	1.185	1.182	1.159	1.152	1.157
California	0.949	0.942	0.875	0.895	0.824	0.874	0.845	0.903	0.919	0.862	1.039
Florida	0.811	0.753	0.709	0.696	0.709	0.721	0.726	0.666	0.617	0.638	0.615
Maryland	0.534	0.486	0.461	0.463	0.458	0.418	0.404	0.397	0.378	0.380	0.344
Michigan	0.939	0.878	0.882	0.879	0.845	0.830	0.835	0.830	0.780	0.762	0.738
Minnesota	2.876	2.690	2.651	2.587	2.495	2.388	2.349	2.307	2.203	2.167	2.119
New Jersey	0.230	0.209	0.203	0.212	0.216	0.204	0.207	0.210	0.209	0.226	0.203
New York	0.397	0.369	0.366	0.361	0.358	0.357	0.356	0.343	0.333	0.327	0.328
North Carolina	1.625	1.452	1.436	1.458	1.417	1.333	1.281	1.331	1.217	1.233	1.158
Pennsylvania	0.752	0.698	0.676	0.681	0.667	0.668	0.674	0.681	0.672	0.707	0.675
Vermont	1.900	1.742	1.704	1.669	1.655	1.642	1.635	1.598	1.575	1.574	1.596
Washington	1.730	1.661	1.661	1.582	1.367	1.407	1.456	1.476	1.532	1.477	1.445
Wisconsin	2.516	2.354	2.340	2.289	2.192	2.140	2.137	2.118	2.004	1.984	1.940
11 States	1.083	1.024	0.991	0.989	0.942	0.944	0.935	0.946	0.923	0.908	0.939

Source: US Department of Commerce, Bureau of Economic Analysis.

Table B-2. Employment Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total jobs ---					
US	619,400	683,200	734,300	766,700	796,000	809,400	864,100	933,400	996,700	1,027,200	1,151,500
California	150,710	164,734	183,294	196,639	201,215	201,516	212,341	225,306	238,295	243,181	235,995
Florida	64,010	70,797	73,534	76,868	79,114	79,641	85,097	90,682	95,995	98,215	98,407
Maryland	7,814	9,014	9,939	10,334	10,760	11,309	12,694	14,100	15,528	16,693	20,168
Michigan	14,015	15,551	16,233	16,392	16,662	16,809	17,889	19,239	21,686	22,413	27,797
Minnesota	9,818	11,259	11,503	12,524	12,823	13,024	13,254	14,017	15,073	14,713	17,919
New Jersey	15,120	16,818	17,470	18,409	19,414	20,379	22,035	24,411	25,922	26,803	26,518
New York	27,768	29,740	31,208	32,256	34,159	35,716	37,551	39,536	42,005	43,420	42,450
North Carolina	13,050	15,229	16,102	15,945	16,214	15,873	17,838	20,007	22,731	24,069	28,052
Pennsylvania	19,696	21,192	23,104	23,913	24,675	25,599	27,109	28,509	30,803	33,081	38,359
Vermont	1,399	1,623	1,771	1,771	1,920	1,956	2,109	2,294	2,314	2,396	3,229
Washington	12,818	15,199	16,657	18,822	20,205	20,153	21,752	23,126	24,019	24,736	27,798
Wisconsin	9,709	10,772	11,607	12,096	12,488	12,685	13,206	14,784	15,142	15,368	19,218
11 States	318,159	352,188	381,214	403,713	415,490	418,944	445,324	476,475	507,508	521,668	543,460
						--- Per 100 persons ---					
US	0.282	0.308	0.327	0.337	0.347	0.349	0.370	0.396	0.419	0.428	0.475
California	0.674	0.721	0.788	0.826	0.829	0.812	0.837	0.872	0.901	0.897	0.850
Florida	0.720	0.775	0.776	0.781	0.776	0.761	0.792	0.821	0.846	0.842	0.820
Maryland	0.186	0.214	0.235	0.244	0.252	0.264	0.294	0.323	0.352	0.372	0.442
Michigan	0.153	0.169	0.176	0.177	0.181	0.184	0.198	0.213	0.239	0.246	0.303
Minnesota	0.247	0.281	0.285	0.307	0.312	0.315	0.320	0.337	0.360	0.350	0.423
New Jersey	0.206	0.229	0.237	0.250	0.262	0.274	0.295	0.325	0.343	0.352	0.346
New York	0.156	0.168	0.177	0.184	0.194	0.203	0.212	0.223	0.236	0.243	0.238
North Carolina	0.230	0.265	0.278	0.270	0.272	0.264	0.294	0.325	0.363	0.381	0.438
Pennsylvania	0.166	0.179	0.195	0.201	0.208	0.216	0.229	0.241	0.262	0.281	0.325
Vermont	0.284	0.326	0.350	0.346	0.372	0.377	0.403	0.436	0.437	0.449	0.598
Washington	0.340	0.391	0.415	0.453	0.477	0.471	0.506	0.532	0.546	0.556	0.613
Wisconsin	0.210	0.233	0.249	0.257	0.264	0.268	0.280	0.312	0.319	0.323	0.402
11 States	0.386	0.422	0.451	0.471	0.479	0.478	0.503	0.532	0.559	0.567	0.581

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Table B-2. Employment Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total jobs ---					
US	1,194,000	1,216,100	1,298,400	1,358,600	1,350,900	1,474,800	1,572,800	1,637,600	1,734,300	1,802,800	1,875,100
California	258,668	270,451	284,839	286,904	289,274	312,322	335,936	351,893	377,786	382,843	395,585
Florida	101,874	103,306	109,175	117,535	117,194	127,325	133,719	139,684	148,670	155,340	160,477
Maryland	21,328	21,865	23,430	23,644	22,990	24,839	25,863	26,588	27,852	28,614	29,313
Michigan	28,801	29,874	32,516	33,972	33,858	36,429	39,992	41,802	44,552	46,457	47,551
Minnesota	17,544	17,960	18,892	20,004	20,141	21,308	22,630	23,828	25,050	25,980	26,400
New Jersey	27,193	27,429	27,340	26,829	27,638	29,731	30,613	32,457	34,129	35,500	36,386
New York	44,218	44,260	46,429	47,579	48,043	51,715	51,993	52,399	55,113	57,026	59,269
North Carolina	29,257	29,701	33,103	34,784	34,014	38,802	40,796	44,932	48,830	52,784	55,655
Pennsylvania	39,797	40,610	43,857	45,370	44,315	47,231	49,605	51,662	54,082	55,942	58,615
Vermont	3,494	3,387	3,741	3,902	3,841	4,417	4,635	4,620	4,870	5,069	5,373
Washington	28,230	29,118	32,777	34,542	34,131	37,303	40,690	40,101	41,075	43,079	44,987
Wisconsin	19,129	19,319	21,159	22,569	22,772	24,094	25,217	26,619	27,880	28,947	30,237
11 States	575,315	593,020	630,829	650,055	650,168	703,801	749,696	784,186	834,776	860,555	890,579
						--- Per 100 persons ---					
US	0.488	0.493	0.520	0.539	0.530	0.572	0.604	0.623	0.654	0.673	0.694
California	0.909	0.926	0.951	0.943	0.937	1.003	1.073	1.117	1.189	1.188	1.210
Florida	0.828	0.817	0.839	0.884	0.868	0.928	0.958	0.985	1.031	1.058	1.076
Maryland	0.458	0.463	0.488	0.487	0.469	0.503	0.519	0.529	0.551	0.562	0.571
Michigan	0.312	0.323	0.349	0.362	0.358	0.382	0.417	0.433	0.457	0.475	0.484
Minnesota	0.408	0.414	0.431	0.452	0.450	0.471	0.496	0.517	0.539	0.554	0.559
New Jersey	0.353	0.355	0.352	0.345	0.353	0.378	0.387	0.407	0.426	0.441	0.449
New York	0.246	0.246	0.258	0.264	0.266	0.285	0.286	0.289	0.304	0.314	0.326
North Carolina	0.451	0.452	0.497	0.515	0.498	0.559	0.578	0.625	0.668	0.711	0.738
Pennsylvania	0.336	0.342	0.369	0.380	0.370	0.393	0.412	0.429	0.449	0.466	0.488
Vermont	0.636	0.607	0.663	0.688	0.674	0.770	0.801	0.793	0.831	0.861	0.910
Washington	0.608	0.613	0.669	0.689	0.664	0.711	0.763	0.738	0.745	0.769	0.791
Wisconsin	0.397	0.398	0.432	0.456	0.455	0.477	0.495	0.518	0.539	0.557	0.579
11 States	0.606	0.615	0.643	0.654	0.646	0.693	0.732	0.759	0.801	0.817	0.837

Source: US Department of Commerce, Bureau of Economic Analysis.

Table B-3. Employment Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Total jobs ---					
US	1,723,200	1,741,300	1,746,500	1,724,000	1,694,400	1,657,000	1,625,000	1,622,400	1,613,300	1,621,200	1,632,800
California	182,005	185,399	190,764	191,556	191,005	185,062	178,950	177,023	170,320	168,359	172,849
Florida	50,575	52,369	49,656	49,752	49,927	49,860	48,869	48,739	47,937	48,454	47,236
Maryland	31,056	30,891	29,666	26,575	25,616	25,309	25,303	26,790	27,496	27,314	25,883
Michigan	51,945	52,585	52,194	49,040	46,908	46,709	45,652	45,423	45,318	44,569	44,905
Minnesota	50,108	50,092	49,573	48,940	47,712	46,659	46,194	45,628	44,616	45,334	46,394
New Jersey	50,436	50,006	49,697	50,187	48,660	46,493	47,558	47,757	49,024	49,681	49,333
New York	96,215	96,295	95,141	91,231	89,793	85,178	83,528	82,862	79,540	78,388	77,210
North Carolina	41,666	42,567	43,744	45,614	44,790	44,399	45,467	45,141	46,164	47,697	50,847
Pennsylvania	100,481	100,809	100,949	97,982	95,408	93,007	91,260	90,794	90,869	90,807	91,575
Vermont	2,486	2,565	2,557	2,463	2,464	2,485	2,458	2,606	2,702	3,002	3,144
Washington	31,798	33,157	33,021	32,138	32,076	31,971	31,175	30,812	31,297	31,320	32,565
Wisconsin	64,269	64,448	64,748	65,108	64,517	63,172	61,832	62,259	61,536	62,109	63,013
11 States	656,825	664,888	666,569	659,355	649,083	635,126	624,718	622,972	617,279	618,646	627,744
						--- Per 100 persons ---					
US	0.784	0.784	0.778	0.759	0.738	0.715	0.695	0.688	0.678	0.675	0.674
California	0.814	0.812	0.820	0.805	0.786	0.746	0.706	0.685	0.644	0.621	0.622
Florida	0.569	0.573	0.524	0.506	0.490	0.476	0.455	0.441	0.422	0.415	0.394
Maryland	0.740	0.733	0.702	0.629	0.601	0.591	0.587	0.614	0.623	0.609	0.567
Michigan	0.567	0.571	0.564	0.530	0.509	0.512	0.505	0.502	0.499	0.488	0.489
Minnesota	1.259	1.251	1.228	1.198	1.160	1.129	1.115	1.097	1.066	1.078	1.095
New Jersey	0.687	0.680	0.674	0.680	0.657	0.626	0.637	0.635	0.648	0.652	0.643
New York	0.539	0.543	0.540	0.519	0.511	0.484	0.472	0.467	0.447	0.440	0.432
North Carolina	0.735	0.742	0.754	0.773	0.752	0.738	0.748	0.732	0.738	0.755	0.794
Pennsylvania	0.846	0.850	0.850	0.826	0.805	0.785	0.771	0.768	0.772	0.771	0.775
Vermont	0.505	0.515	0.506	0.481	0.478	0.479	0.470	0.495	0.510	0.562	0.582
Washington	0.843	0.853	0.823	0.774	0.757	0.748	0.725	0.709	0.711	0.703	0.719
Wisconsin	1.393	1.391	1.388	1.382	1.365	1.336	1.310	1.315	1.296	1.306	1.319
11 States	0.798	0.798	0.789	0.769	0.748	0.725	0.706	0.696	0.680	0.672	0.671

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Table B-3. Employment Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Total jobs ---					
US	1,645,500	1,652,400	1,677,200	1,683,700	1,670,700	1,689,700	1,696,700	1,703,100	1,713,600	1,711,100	1,713,200
California	176,395	182,025	190,545	190,591	187,825	184,324	181,407	176,577	180,250	182,745	185,965
Florida	47,665	48,299	46,609	46,284	42,867	44,452	43,647	42,895	42,287	41,869	42,116
Maryland	25,242	25,068	25,096	24,240	23,002	22,232	21,744	21,712	21,479	21,719	21,945
Michigan	45,344	45,479	45,373	45,046	45,326	45,977	45,336	45,510	45,068	42,685	41,447
Minnesota	46,176	47,987	49,697	51,105	51,200	51,813	52,015	53,501	55,295	54,300	52,650
New Jersey	47,945	47,022	45,270	43,392	42,353	41,950	40,893	40,046	38,734	38,036	37,865
New York	75,403	73,092	70,514	69,629	66,697	65,031	64,015	62,169	61,270	59,815	59,800
North Carolina	52,194	50,843	51,302	51,558	50,923	52,331	54,481	56,855	57,085	56,307	56,318
Pennsylvania	92,211	92,765	91,207	90,866	88,929	89,900	88,759	87,225	86,291	85,748	85,759
Vermont	3,357	3,373	3,729	3,801	3,903	4,062	4,250	4,434	4,545	4,299	4,301
Washington	33,478	36,367	38,399	38,359	38,435	39,779	41,086	42,379	42,947	42,463	41,102
Wisconsin	63,775	64,663	65,675	65,801	65,009	65,198	66,377	66,741	67,222	66,325	65,925
11 States	633,782	643,891	652,902	651,043	639,772	642,018	639,995	637,875	641,203	636,496	635,393
						--- Per 100 persons ---					
US	0.673	0.669	0.672	0.668	0.655	0.655	0.652	0.648	0.646	0.639	0.634
California	0.620	0.623	0.636	0.627	0.608	0.592	0.579	0.561	0.567	0.567	0.569
Florida	0.387	0.382	0.358	0.348	0.317	0.324	0.313	0.302	0.293	0.285	0.283
Maryland	0.542	0.530	0.523	0.499	0.469	0.450	0.436	0.432	0.425	0.426	0.428
Michigan	0.492	0.491	0.487	0.479	0.479	0.482	0.473	0.471	0.463	0.436	0.422
Minnesota	1.075	1.106	1.133	1.154	1.145	1.146	1.139	1.162	1.190	1.158	1.114
New Jersey	0.622	0.609	0.584	0.557	0.541	0.533	0.516	0.503	0.484	0.472	0.468
New York	0.420	0.406	0.392	0.386	0.369	0.358	0.353	0.343	0.338	0.330	0.329
North Carolina	0.805	0.774	0.771	0.764	0.745	0.753	0.772	0.791	0.781	0.758	0.746
Pennsylvania	0.778	0.782	0.767	0.761	0.742	0.748	0.737	0.724	0.717	0.714	0.715
Vermont	0.611	0.605	0.661	0.670	0.685	0.708	0.734	0.761	0.775	0.730	0.728
Washington	0.722	0.766	0.784	0.765	0.748	0.758	0.770	0.780	0.779	0.758	0.723
Wisconsin	1.322	1.331	1.340	1.329	1.299	1.290	1.303	1.299	1.299	1.275	1.262
11 States	0.667	0.667	0.665	0.655	0.636	0.632	0.625	0.617	0.615	0.604	0.597

Source: US Department of Commerce, Bureau of Economic Analysis.

APPENDIX C

Gross State Product Data

Table C-1. Total Gross State Product for New York, 11 Competitor States and the US, 1977-98

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Total (Million dollars) ---					
US	1,985,693	2,249,045	2,503,867	2,731,618	3,069,751	3,217,626	3,446,583	3,866,334	4,151,449	4,355,877	4,683,245
California	229,311	263,435	294,882	327,907	368,301	392,914	425,811	484,068	528,950	567,025	624,022
Florida	66,304	77,368	88,681	101,247	115,857	125,470	139,617	158,547	173,281	187,870	206,974
Maryland	35,506	39,427	43,433	47,261	52,823	56,000	61,836	69,722	76,989	84,111	92,480
Michigan	88,058	98,003	104,174	102,791	113,171	113,113	124,902	140,886	151,202	161,005	167,518
Minnesota	36,288	41,097	46,395	49,712	54,634	56,418	60,586	69,870	74,391	77,853	83,920
New Jersey	66,790	74,159	82,717	90,450	100,583	107,302	119,087	134,544	146,920	159,622	176,140
New York	177,998	197,303	215,307	234,249	259,312	280,239	303,353	339,084	366,553	393,523	425,501
North Carolina	44,106	50,386	55,293	59,743	66,714	69,696	78,385	89,700	98,176	106,263	114,917
Pennsylvania	100,529	112,206	123,077	130,467	141,885	145,541	155,212	170,796	180,678	190,765	206,519
Vermont	3,355	3,968	4,437	4,916	5,488	5,785	6,304	6,970	7,655	8,304	9,284
Washington	35,965	42,014	48,181	51,964	57,694	60,731	65,380	71,086	74,494	80,462	86,898
Wisconsin	40,814	45,641	50,447	53,210	57,561	59,328	62,895	69,999	74,110	77,967	82,291
11 States	747,026	847,704	941,717	1,019,668	1,134,711	1,192,298	1,300,015	1,466,188	1,586,846	1,701,247	1,850,963
						--- Per capita (Dollars) ---					
US	9,036	10,126	11,150	12,022	13,378	13,889	14,742	16,395	17,449	18,139	19,329
California	10,260	11,534	12,680	13,777	15,165	15,831	16,791	18,730	20,005	20,922	22,465
Florida	7,459	8,473	9,364	10,290	11,367	11,982	12,988	14,361	15,266	16,102	17,252
Maryland	8,465	9,361	10,284	11,179	12,394	13,075	14,336	15,972	17,446	18,746	20,256
Michigan	9,616	10,650	11,263	11,106	12,289	12,409	13,805	15,568	16,659	17,639	18,233
Minnesota	9,118	10,262	11,489	12,169	13,287	13,656	14,629	16,805	17,779	18,513	19,815
New Jersey	9,097	10,081	11,219	12,262	13,579	14,440	15,947	17,902	19,420	20,942	22,963
New York	9,971	11,134	12,210	13,335	14,761	15,932	17,151	19,108	20,602	22,067	23,812
North Carolina	7,781	8,778	9,531	10,128	11,200	11,579	12,899	14,552	15,698	16,810	17,945
Pennsylvania	8,461	9,457	10,366	10,993	11,965	12,287	13,112	14,456	15,350	16,190	17,486
Vermont	6,817	7,963	8,774	9,592	10,644	11,144	12,047	13,234	14,442	15,549	17,184
Washington	9,534	10,811	12,007	12,507	13,621	14,201	15,204	16,365	16,930	18,070	19,175
Wisconsin	8,847	9,854	10,812	11,292	12,179	12,546	13,321	14,782	15,609	16,395	17,223
11 States	9,072	10,168	11,149	11,894	13,078	13,604	14,683	16,372	17,489	18,480	19,797

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Table C-1. Total Gross State Product for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total (Million dollars) ---					
US	5,092,174	5,411,353	5,706,658	5,895,430	6,209,096	6,513,026	6,930,791	7,309,516	7,715,901	8,240,312	8,745,219
California	684,452	742,866	798,237	814,216	830,950	846,994	878,124	924,582	971,777	1,043,669	1,118,945
Florida	226,905	244,303	258,040	269,514	285,177	304,651	325,135	344,381	365,837	391,073	418,851
Maryland	102,686	109,548	114,971	117,600	120,700	126,485	134,066	139,732	145,390	155,008	164,798
Michigan	178,068	186,712	190,700	194,086	206,526	222,734	246,629	253,940	264,848	280,178	294,505
Minnesota	90,070	96,150	100,354	103,858	111,868	115,517	124,986	131,848	141,479	152,340	161,392
New Jersey	197,534	208,345	216,941	224,276	235,423	246,607	257,970	271,297	285,528	303,580	319,201
New York	462,402	479,452	502,102	504,533	535,201	551,181	575,671	597,823	634,150	669,446	706,886
North Carolina	126,345	135,983	141,199	147,574	160,116	168,859	182,164	194,514	203,971	220,900	235,752
Pennsylvania	224,508	237,989	249,704	260,425	275,144	287,797	300,540	318,066	328,704	347,169	364,039
Vermont	10,435	11,320	11,750	11,751	12,544	13,140	13,741	13,981	14,679	15,479	16,257
Washington	95,651	104,758	115,642	122,597	130,772	138,379	146,543	151,469	161,954	176,226	192,864
Wisconsin	89,838	95,429	100,434	104,917	112,324	119,510	127,220	133,653	141,037	149,283	157,761
11 States	2,026,492	2,173,403	2,297,972	2,370,814	2,481,544	2,590,673	2,737,118	2,877,463	3,025,204	3,234,905	3,444,365
						--- Per capita (Dollars) ---					
US	20,827	21,924	22,876	23,380	24,347	25,266	26,623	27,814	29,092	30,772	32,360
California	24,046	25,425	26,652	26,771	26,913	27,193	28,040	29,358	30,577	32,394	34,237
Florida	18,438	19,331	19,821	20,280	21,117	22,215	23,287	24,277	25,358	26,634	28,095
Maryland	22,046	23,173	23,965	24,217	24,620	25,591	26,892	27,815	28,749	30,436	32,124
Michigan	19,317	20,178	20,482	20,658	21,808	23,374	25,732	26,288	27,194	28,632	29,990
Minnesota	20,965	22,164	22,874	23,458	25,018	25,547	27,373	28,629	30,440	32,498	34,147
New Jersey	25,613	26,966	27,967	28,811	30,075	31,316	32,577	34,059	35,648	37,692	39,429
New York	25,773	26,661	27,890	27,984	29,598	30,383	31,706	32,936	34,951	36,898	38,927
North Carolina	19,496	20,712	21,211	21,869	23,437	24,305	25,799	27,071	27,912	29,736	31,243
Pennsylvania	18,953	20,056	20,991	21,805	22,965	23,939	24,957	26,407	27,306	28,892	30,331
Vermont	18,981	20,297	20,814	20,720	22,003	22,892	23,736	23,988	25,034	26,295	27,527
Washington	20,615	22,071	23,597	24,454	25,447	26,369	27,469	27,890	29,393	31,446	33,908
Wisconsin	18,629	19,649	20,487	21,184	22,444	23,640	24,967	26,018	27,260	28,707	30,210
11 States	21,333	22,524	23,415	23,853	24,673	25,505	26,718	27,852	29,011	30,704	32,368

Source: US Department of Commerce, Bureau of Economic Analysis.

Table C-2. Gross State Product Originating in Farming for New York, 11 Competitor States and the US, 1977-98

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Total (Million dollars) ---					
US	47,205	54,745	64,450	56,106	69,896	65,143	49,152	68,532	67,100	62,958	65,075
California	4,945	5,308	6,939	7,243	7,325	7,307	5,956	7,537	7,657	7,756	8,785
Florida	1,526	1,989	2,214	2,215	2,357	2,534	2,483	2,662	2,792	2,868	3,097
Maryland	257	340	354	272	385	411	340	498	521	510	518
Michigan	1,081	1,176	1,362	1,402	1,559	1,474	1,178	1,453	1,554	1,282	1,274
Minnesota	2,563	2,816	2,936	2,805	3,258	2,962	1,951	3,212	2,940	2,771	2,792
New Jersey	212	248	252	245	303	311	293	323	355	354	384
New York	798	955	1,158	1,144	1,328	1,325	1,107	1,230	1,245	1,298	1,320
North Carolina	1,318	1,680	1,515	1,440	1,936	1,934	1,427	2,050	1,900	1,813	1,948
Pennsylvania	926	1,077	1,290	1,119	1,431	1,357	1,138	1,530	1,558	1,597	1,575
Vermont	113	146	169	170	201	204	171	176	193	192	214
Washington	927	1,217	1,331	1,357	1,582	1,440	1,448	1,670	1,438	1,590	1,683
Wisconsin	1,881	2,063	2,555	2,655	2,773	2,700	2,056	2,562	2,531	2,619	2,580
11 States	15,749	18,060	20,917	20,923	23,110	22,634	18,441	23,673	23,439	23,352	24,850
						--- Per capita (Dollars) ---					
US	215	246	287	247	305	281	210	291	282	262	269
California	221	232	298	304	302	294	235	292	290	286	316
Florida	172	218	234	225	231	242	231	241	246	246	258
Maryland	61	81	84	64	90	96	79	114	118	114	113
Michigan	118	128	147	151	169	162	130	161	171	140	139
Minnesota	644	703	727	687	792	717	471	773	703	659	659
New Jersey	29	34	34	33	41	42	39	43	47	46	50
New York	45	54	66	65	76	75	63	69	70	73	74
North Carolina	233	293	261	244	325	321	235	333	304	287	304
Pennsylvania	78	91	109	94	121	115	96	129	132	136	133
Vermont	230	293	334	332	390	393	327	334	364	360	396
Washington	246	313	332	327	373	337	337	384	327	357	371
Wisconsin	408	445	548	563	587	571	435	541	533	551	540
11 States	191	217	248	244	266	258	208	264	258	254	266

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Table C-2. Gross State Product Originating in Farming for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Total (Million dollars) ---					
US	63,801	76,230	79,575	73,200	80,469	73,567	83,567	73,187	92,192	88,046	80,160
California	8,767	9,469	10,344	9,052	10,037	10,315	11,246	10,353	11,787	12,837	11,645
Florida	3,385	3,612	3,233	3,484	3,514	3,290	3,275	2,959	3,408	3,345	3,463
Maryland	556	615	606	539	582	531	576	477	626	499	530
Michigan	1,217	1,616	1,506	1,420	1,385	1,365	1,326	1,415	1,412	1,415	1,302
Minnesota	2,187	3,288	3,333	2,666	2,669	1,448	2,705	2,273	3,661	2,700	2,674
New Jersey	366	390	381	368	376	395	444	408	455	412	416
New York	1,211	1,394	1,398	1,257	1,294	1,276	1,273	1,136	1,314	1,071	1,246
North Carolina	2,167	2,451	2,902	3,065	3,136	3,205	3,666	3,490	4,080	4,129	3,340
Pennsylvania	1,432	1,742	1,717	1,416	1,779	1,629	1,647	1,392	1,793	1,492	1,570
Vermont	206	221	204	186	240	195	209	183	220	207	231
Washington	1,598	1,946	2,066	2,106	2,490	2,575	2,519	2,473	3,072	2,641	2,621
Wisconsin	2,107	2,946	2,759	2,359	2,360	2,026	2,377	2,087	2,653	2,294	2,542
11 States	23,988	28,296	29,051	26,661	28,568	26,974	29,990	27,510	33,167	31,971	30,334
						--- Per capita (Dollars) ---					
US	261	309	319	290	316	285	321	278	348	329	297
California	308	324	345	298	325	331	359	329	371	398	356
Florida	275	286	248	262	260	240	235	209	236	228	232
Maryland	119	130	126	111	119	107	116	95	124	98	103
Michigan	132	175	162	151	146	143	138	146	145	145	133
Minnesota	509	758	760	602	597	320	592	494	788	576	566
New Jersey	47	50	49	47	48	50	56	51	57	51	51
New York	67	78	78	70	72	70	70	63	72	59	69
North Carolina	334	373	436	454	459	461	519	486	558	556	443
Pennsylvania	121	147	144	119	148	136	137	116	149	124	131
Vermont	375	396	361	328	421	340	361	314	375	352	391
Washington	344	410	422	420	485	491	472	455	558	471	461
Wisconsin	437	607	563	476	472	401	466	406	513	441	487
11 States	253	293	296	268	284	266	293	266	318	303	285

Source: US Department of Commerce, Bureau of Economic Analysis.

Table C-3. Gross State Product Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Total (Million dollars) ---					
US	7,142	8,508	10,061	10,592	11,215	11,939	13,479	15,253	17,615	19,407	23,825
California	1,457	1,692	2,010	2,199	2,404	2,535	2,696	3,144	3,357	3,664	4,784
Florida	578	655	748	794	854	877	962	1,102	1,263	1,436	1,684
Maryland	110	128	149	162	168	176	227	253	331	387	451
Michigan	170	198	225	229	240	265	277	323	360	412	525
Minnesota	118	143	166	173	186	208	216	254	254	266	373
New Jersey	180	206	227	244	258	284	337	397	487	542	690
New York	312	346	384	397	436	483	528	608	676	761	977
North Carolina	137	177	218	222	225	219	277	317	398	428	565
Pennsylvania	223	255	301	309	334	380	410	479	515	585	794
Vermont	15	18	21	21	25	29	33	40	37	42	68
Washington	326	456	540	573	548	502	629	606	852	1,043	1,126
Wisconsin	120	143	173	186	202	232	248	298	299	315	425
11 States	3,434	4,071	4,778	5,112	5,444	5,707	6,312	7,213	8,153	9,120	11,485
						--- Per capita (Dollars) ---					
US	32	38	45	47	49	52	58	65	74	81	98
California	65	74	86	92	99	102	106	122	127	135	172
Florida	65	72	79	81	84	84	89	100	111	123	140
Maryland	26	30	35	38	39	41	53	58	75	86	99
Michigan	19	22	24	25	26	29	31	36	40	45	57
Minnesota	30	36	41	42	45	50	52	61	61	63	88
New Jersey	25	28	31	33	35	38	45	53	64	71	90
New York	17	20	22	23	25	27	30	34	38	43	55
North Carolina	24	31	38	38	38	36	46	51	64	68	88
Pennsylvania	19	21	25	26	28	32	35	41	44	50	67
Vermont	30	36	42	41	48	56	63	76	70	79	126
Washington	86	117	135	138	129	117	146	140	194	234	248
Wisconsin	26	31	37	39	43	49	53	63	63	66	89
11 States	42	49	57	60	63	65	71	81	90	99	123

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Table C-3. Gross State Product Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Total (Million dollars) ---					
US	25,275	25,799	28,678	29,726	31,184	34,778	34,926	36,657	38,252	41,607	45,045
California	4,912	5,292	6,010	6,090	6,474	7,079	7,095	7,425	7,781	8,541	9,255
Florida	1,779	1,840	2,026	2,198	2,300	2,549	2,629	2,674	2,862	3,061	3,288
Maryland	516	511	535	508	520	578	603	617	659	701	753
Michigan	554	586	640	665	706	765	849	907	999	1,091	1,169
Minnesota	362	376	415	421	461	505	489	506	525	565	620
New Jersey	723	728	747	734	761	880	901	937	1,000	1,075	1,150
New York	1,010	1,031	1,105	1,111	1,123	1,222	1,218	1,283	1,344	1,443	1,560
North Carolina	593	577	633	645	669	775	786	871	991	1,122	1,247
Pennsylvania	815	871	987	1,049	1,110	1,227	1,192	1,225	1,258	1,348	1,475
Vermont	67	67	73	75	76	81	80	84	88	93	104
Washington	1,361	1,377	1,647	1,645	1,551	1,611	1,656	1,742	1,657	1,785	1,839
Wisconsin	414	432	487	518	556	616	600	616	636	675	734
11 States	12,096	12,657	14,200	14,548	15,184	16,666	16,880	17,604	18,456	20,057	21,634
						--- Per capita (Dollars) ---					
US	103	105	115	118	122	135	134	139	144	155	167
California	173	181	201	200	210	227	227	236	245	265	283
Florida	145	146	156	165	170	186	188	189	198	208	221
Maryland	111	108	112	105	106	117	121	123	130	138	147
Michigan	60	63	69	71	75	80	89	94	103	111	119
Minnesota	84	87	95	95	103	112	107	110	113	121	131
New Jersey	94	94	96	94	97	112	114	118	125	133	142
New York	56	57	61	62	62	67	67	71	74	80	86
North Carolina	92	88	95	96	98	112	111	121	136	151	165
Pennsylvania	69	73	83	88	93	102	99	102	105	112	123
Vermont	122	120	129	132	133	141	138	144	150	158	176
Washington	293	290	336	328	302	307	310	321	301	319	323
Wisconsin	86	89	99	105	111	122	118	120	123	130	141
11 States	127	131	145	146	151	164	165	170	177	190	203

Source: US Department of Commerce, Bureau of Economic Analysis.

Table C-4. Gross State Product Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Total (Million dollars) ---					
US	42,523	44,160	46,196	52,735	56,978	63,581	67,275	69,045	71,999	76,245	79,098
California	5,017	5,193	5,480	6,331	6,873	7,665	8,045	8,046	8,179	9,135	9,981
Florida	1,246	1,400	1,426	1,681	1,803	2,080	2,287	2,342	2,390	2,618	2,681
Maryland	867	868	870	920	977	1,055	1,228	1,238	1,359	1,460	1,477
Michigan	1,531	1,594	1,646	1,793	1,879	2,037	2,205	2,291	2,458	2,593	2,658
Minnesota	1,010	1,035	1,111	1,275	1,403	1,641	1,815	1,690	1,753	1,826	2,092
New Jersey	1,481	1,591	1,681	1,980	2,123	2,376	2,636	2,602	2,893	2,874	3,134
New York	3,078	2,923	3,038	3,345	3,675	4,037	4,258	4,218	4,333	4,460	4,475
North Carolina	700	779	865	1,048	1,143	1,278	1,518	1,563	1,718	1,847	1,694
Pennsylvania	2,331	2,422	2,532	2,867	3,085	3,461	3,684	3,669	4,051	4,050	4,364
Vermont	33	27	31	36	43	53	59	71	98	88	77
Washington	785	840	861	939	1,009	1,092	1,240	1,209	1,257	1,314	1,366
Wisconsin	1,706	1,719	1,796	2,072	2,228	2,426	2,657	2,738	2,836	2,940	3,052
11 States	16,707	17,468	18,299	20,942	22,566	25,164	27,374	27,459	28,992	30,745	32,576
						--- Per capita (Dollars) ---					
US	193	199	206	232	248	274	288	293	303	318	326
California	224	227	236	266	283	309	317	311	309	337	359
Florida	140	153	151	171	177	199	213	212	211	224	223
Maryland	207	206	206	218	229	246	285	284	308	325	324
Michigan	167	173	178	194	204	223	244	253	271	284	289
Minnesota	254	258	275	312	341	397	438	406	419	434	494
New Jersey	202	216	228	268	287	320	353	346	382	377	409
New York	172	165	172	190	209	230	241	238	244	250	250
North Carolina	123	136	149	178	192	212	250	254	275	292	265
Pennsylvania	196	204	213	242	260	292	311	311	344	344	369
Vermont	67	54	61	70	83	102	113	135	185	165	143
Washington	208	216	215	226	238	255	288	278	286	295	301
Wisconsin	370	371	385	440	471	513	563	578	597	618	639
11 States	203	210	217	244	260	287	309	307	320	334	348

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Table C-4. Gross State Product Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Total (Million dollars) ---					
US	84,623	88,936	96,392	103,695	105,891	107,571	110,229	121,127	118,670	119,307	122,022
California	9,961	10,911	12,447	13,300	13,437	12,869	12,604	13,383	13,275	13,500	13,763
Florida	2,879	2,883	3,133	3,145	3,116	3,665	3,374	3,125	3,443	3,270	3,414
Maryland	1,501	1,761	1,894	1,829	1,586	1,553	1,473	1,597	1,809	1,818	1,826
Michigan	3,133	3,217	3,457	3,555	3,811	3,594	3,908	3,989	3,308	3,182	3,161
Minnesota	2,129	2,477	2,505	2,631	2,942	3,023	3,085	3,279	3,348	3,288	3,238
New Jersey	3,302	3,252	3,406	3,474	3,323	3,379	3,304	3,407	3,137	3,074	3,084
New York	4,862	5,152	4,993	5,646	5,704	5,819	5,539	5,317	5,599	5,653	5,557
North Carolina	1,874	2,047	2,122	2,239	2,275	2,586	2,950	3,268	3,000	2,956	3,036
Pennsylvania	4,413	4,742	4,816	4,989	5,231	5,281	5,358	5,943	5,663	5,674	5,765
Vermont	89	111	153	151	157	168	151	214	209	207	209
Washington	1,545	1,617	1,580	1,692	1,979	2,129	2,383	2,538	2,590	2,554	2,473
Wisconsin	3,468	3,314	3,403	3,793	4,282	4,164	4,107	4,381	4,374	4,274	4,291
11 States	34,294	36,332	38,916	40,798	42,139	42,411	42,697	45,124	44,156	43,797	44,260
						--- Per capita (Dollars) ---					
US	346	360	386	411	415	417	423	461	447	446	452
California	350	373	416	437	435	413	402	425	418	419	421
Florida	234	228	241	237	231	267	242	220	239	223	229
Maryland	322	373	395	377	324	314	295	318	358	357	356
Michigan	340	348	371	378	402	377	408	413	340	325	322
Minnesota	496	571	571	594	658	669	676	712	720	701	685
New Jersey	428	421	439	446	425	429	417	428	392	382	381
New York	271	286	277	313	315	321	305	293	309	312	306
North Carolina	289	312	319	332	333	372	418	455	411	398	402
Pennsylvania	373	400	405	418	437	439	445	493	470	472	480
Vermont	162	199	271	266	275	293	261	367	356	352	354
Washington	333	341	322	337	385	406	447	467	470	456	435
Wisconsin	719	682	694	766	856	824	806	853	845	822	822
11 States	361	377	397	410	419	418	417	437	423	416	416

Source: US Department of Commerce, Bureau of Economic Analysis.

APPENDIX D

Income/Earnings Data

Table D-1. Total Personal Income for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total (Thous. dollars) ---					
US	1,630,901,000	1,841,340,000	2,072,839,000	2,313,921,000	2,588,335,000	2,756,954,000	2,935,040,000	3,260,064,000	3,498,662,000	3,697,359,000	3,945,515,000
California	191,535,859	219,674,026	252,212,971	286,288,598	320,690,668	341,871,685	367,504,630	411,615,869	447,102,807	477,762,474	517,348,379
Florida	62,309,059	72,332,145	84,093,751	98,881,848	114,109,540	123,450,308	135,842,481	151,951,597	166,919,255	179,951,679	196,939,232
Maryland	34,359,651	38,167,844	42,380,883	47,474,568	52,860,603	56,729,622	61,372,069	68,505,797	74,851,663	80,611,614	87,731,316
Michigan	72,863,170	81,287,324	89,726,826	95,967,358	102,455,356	104,477,364	110,770,972	122,857,126	133,728,039	142,146,336	148,190,827
Minnesota	30,084,592	33,924,083	37,996,214	42,157,461	46,546,070	49,546,236	52,157,843	59,266,803	63,152,359	66,784,230	71,570,231
New Jersey	62,130,478	69,205,804	77,187,623	86,877,231	96,716,662	104,023,404	112,284,254	124,376,990	133,549,209	142,617,056	155,179,004
New York	145,544,294	159,113,654	175,040,414	194,906,383	217,202,765	234,717,141	250,945,491	279,294,227	297,728,526	317,914,037	340,067,920
North Carolina	34,339,219	38,920,853	43,288,100	48,648,088	54,703,954	58,324,335	63,684,965	72,659,088	79,104,660	84,987,516	91,733,651
Pennsylvania	89,035,334	98,539,302	109,533,175	120,478,030	132,631,742	140,801,967	147,436,618	159,652,458	170,033,839	178,937,903	190,656,632
Vermont	3,041,073	3,505,891	3,971,503	4,459,868	5,009,890	5,340,264	5,739,591	6,345,061	6,887,097	7,392,319	8,099,821
Washington	29,544,125	34,536,163	39,987,477	45,337,963	50,418,276	53,161,335	56,434,583	60,901,243	64,846,549	69,114,046	73,871,754
Wisconsin	34,217,764	38,407,973	43,302,180	47,881,343	52,018,498	54,819,209	56,872,800	62,423,359	65,732,720	69,101,074	73,377,745
11 States	643,460,324	728,501,408	823,680,703	924,452,356	1,028,161,259	1,092,545,729	1,170,100,806	1,300,555,391	1,405,908,197	1,499,406,247	1,614,698,592
						--- Per capita (Dollars) ---					
US	7,421	8,291	9,230	10,183	11,280	11,901	12,554	13,824	14,705	15,397	16,284
California	8,570	9,618	10,846	12,029	13,205	13,774	14,491	15,927	16,909	17,628	18,625
Florida	7,010	7,921	8,879	10,049	11,195	11,789	12,637	13,764	14,705	15,423	16,415
Maryland	8,191	9,062	10,035	11,230	12,403	13,246	14,228	15,693	16,961	17,966	19,216
Michigan	7,957	8,834	9,701	10,369	11,125	11,462	12,243	13,576	14,734	15,573	16,130
Minnesota	7,559	8,471	9,409	10,320	11,320	11,992	12,594	14,255	15,093	15,881	16,899
New Jersey	8,462	9,408	10,469	11,778	13,057	13,999	15,036	16,549	17,652	18,711	20,230
New York	8,153	8,979	9,927	11,095	12,364	13,344	14,188	15,739	16,734	17,827	19,031
North Carolina	6,058	6,780	7,461	8,247	9,184	9,690	10,480	11,788	12,649	13,444	14,325
Pennsylvania	7,493	8,305	9,225	10,151	11,184	11,887	12,455	13,512	14,445	15,186	16,142
Vermont	6,179	7,036	7,853	8,702	9,717	10,287	10,968	12,048	12,994	13,842	14,992
Washington	7,832	8,887	9,965	10,913	11,903	12,431	13,124	14,021	14,738	15,522	16,300
Wisconsin	7,417	8,292	9,281	10,161	11,006	11,592	12,046	13,182	13,845	14,530	15,358
11 States											

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Table D-1. Total Personal Income for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total (Thous. dollars) ---					
US	4,255,000,000	4,582,429,000	4,885,525,000	5,065,416,000	5,376,622,000	5,598,446,000	5,878,362,000	6,192,235,000	6,538,103,000	6,942,114,000	7,351,547,000
California	561,121,088	606,701,218	655,567,167	669,842,266	701,571,581	714,107,358	735,104,437	771,470,153	812,404,210	862,755,817	920,452,229
Florida	216,504,523	240,686,677	258,479,049	268,304,176	279,028,337	296,927,420	311,908,852	333,525,354	355,135,853	376,559,054	400,208,545
Maryland	96,071,787	104,005,033	110,449,942	114,466,199	119,417,458	124,076,160	129,848,500	135,115,456	140,809,232	148,263,597	156,759,306
Michigan	158,529,131	169,112,996	177,103,451	181,495,449	192,037,533	203,827,569	219,120,750	231,594,233	238,094,677	252,265,747	264,015,972
Minnesota	75,578,163	82,277,038	87,795,485	90,713,790	97,024,881	99,787,105	107,151,552	113,216,855	122,079,580	129,079,905	138,306,857
New Jersey	170,763,510	182,297,652	192,117,132	195,795,514	208,197,341	213,418,806	220,817,411	233,208,579	246,658,622	262,422,959	278,348,602
New York	369,668,234	395,022,081	419,742,661	431,671,597	455,657,134	464,200,558	478,586,307	503,163,343	530,990,014	554,060,863	583,061,180
North Carolina	100,196,177	108,584,976	115,608,646	120,648,268	130,627,410	139,239,261	147,792,513	157,633,574	167,637,801	179,844,851	190,008,517
Pennsylvania	205,200,231	222,195,142	235,802,317	244,892,208	258,186,143	267,020,437	275,336,918	285,923,242	299,000,902	314,943,536	329,687,099
Vermont	8,904,578	9,769,222	10,192,738	10,332,389	10,999,179	11,356,945	11,897,987	12,448,607	13,072,527	13,763,996	14,529,402
Washington	80,130,195	88,616,005	98,143,118	104,786,247	112,633,619	117,620,618	123,337,471	129,680,828	139,327,838	151,413,176	163,347,867
Wisconsin	78,125,582	84,013,413	89,025,202	92,669,451	99,453,934	104,337,358	110,569,691	115,959,680	121,863,733	129,697,098	137,256,439
11 States	1,751,124,965	1,898,259,372	2,030,284,247	2,093,945,957	2,209,177,416	2,291,719,037	2,392,886,082	2,519,776,561	2,656,084,975	2,821,009,736	2,992,920,835
						--- Per capita (Dollars) ---					
US	17,403	18,566	19,584	20,089	21,082	21,718	22,581	23,562	24,651	25,924	27,203
California	19,713	20,765	21,889	22,024	22,722	22,927	23,473	24,496	25,563	26,779	28,163
Florida	17,593	19,045	19,855	20,189	20,661	21,652	22,340	23,512	24,616	25,645	26,845
Maryland	20,626	22,001	23,023	23,571	24,358	25,104	26,046	26,896	27,844	29,112	30,557
Michigan	17,198	18,276	19,022	19,318	20,278	21,390	22,862	23,975	24,447	25,780	26,885
Minnesota	17,592	18,966	20,011	20,489	21,698	22,068	23,467	24,583	26,267	27,536	29,263
New Jersey	22,142	23,595	24,766	25,153	26,597	27,101	27,885	29,277	30,795	32,582	34,383
New York	20,604	21,966	23,315	23,942	25,199	25,589	26,359	27,721	29,266	30,538	32,108
North Carolina	15,461	16,539	17,367	17,879	19,120	20,042	20,931	21,938	22,940	24,210	25,181
Pennsylvania	17,323	18,725	19,823	20,505	21,550	22,211	22,864	23,738	24,838	26,211	27,469
Vermont	16,197	17,517	18,055	18,218	19,293	19,785	20,553	21,359	22,295	23,382	24,602
Washington	17,270	18,670	20,026	20,901	21,917	22,414	23,119	23,878	25,287	27,018	28,719
Wisconsin	16,201	17,299	18,160	18,711	19,872	20,639	21,699	22,573	23,554	24,941	26,284
11 States											

Source: US Department of Commerce, Bureau of Economic Analysis.

Table D-2. Personal Income Originating in Farming for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total (Thous. dollars) ---					
US	25,194,000	29,205,000	30,948,000	21,304,000	27,987,000	24,446,000	16,923,000	31,178,000	31,038,000	31,979,000	37,723,000
California	3,562,581	3,507,981	4,644,955	5,739,169	4,452,928	4,689,074	4,286,117	5,002,405	5,029,254	5,493,688	6,630,636
Florida	1,074,963	1,285,166	1,365,654	1,755,079	1,469,218	1,905,031	2,668,482	1,941,147	1,951,801	2,098,431	2,250,653
Maryland	147,026	204,199	172,344	63,702	140,328	145,645	87,365	269,562	282,071	291,196	296,769
Michigan	593,753	547,940	575,902	552,545	515,339	419,036	199,972	516,952	621,831	441,052	575,316
Minnesota	1,534,886	1,653,407	1,275,632	921,146	978,116	796,362	67,942	1,362,958	1,228,478	1,519,940	1,982,236
New Jersey	126,478	143,096	134,293	124,503	158,035	170,520	202,303	201,482	232,229	234,906	262,731
New York	349,336	451,023	550,332	534,152	544,156	516,000	357,411	453,853	513,369	618,862	687,720
North Carolina	887,631	1,171,797	777,022	659,433	1,061,463	1,055,401	621,130	1,289,346	1,155,631	1,132,163	1,082,685
Pennsylvania	508,014	551,302	690,444	464,562	671,644	571,323	372,193	833,413	829,547	873,824	851,680
Vermont	69,180	98,156	108,221	110,803	124,722	121,972	83,357	79,937	97,823	96,313	118,239
Washington	616,209	773,843	754,850	890,690	844,882	766,455	1,089,044	1,037,882	746,145	1,064,761	1,055,408
Wisconsin	1,189,347	1,185,192	1,454,784	1,479,349	1,170,329	1,025,092	431,640	938,307	927,825	1,207,266	1,236,934
11 States	10,310,068	11,122,079	11,954,101	12,760,981	11,587,004	11,665,911	10,109,545	13,473,391	13,102,635	14,453,540	16,343,287
						--- Per capita (Dollars) ---					
US	115	131	138	94	122	106	72	132	130	133	156
California	159	154	200	241	183	189	169	194	190	203	239
Florida	121	141	144	178	144	182	248	176	172	180	188
Maryland	35	48	41	15	33	34	20	62	64	65	65
Michigan	65	60	62	60	56	46	22	57	69	48	63
Minnesota	386	413	316	225	238	193	16	328	294	361	468
New Jersey	17	19	18	17	21	23	27	27	31	31	34
New York	20	25	31	30	31	29	20	26	29	35	38
North Carolina	157	204	134	112	178	175	102	209	185	179	169
Pennsylvania	43	46	58	39	57	48	31	71	70	74	72
Vermont	141	197	214	216	242	235	159	152	185	180	219
Washington	163	199	188	214	199	179	253	239	170	239	233
Wisconsin	258	256	312	314	248	217	91	198	195	254	259
11 States	125	133	142	149	134	133	114	150	144	157	175

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Table D-2. Personal Income Originating in Farming for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total (Thous. dollars) ---					
US	36,601,000	43,358,000	43,885,000	38,909,000	45,274,000	43,601,000	45,431,000	36,696,000	49,490,000	45,698,000	43,016,000
California	6,985,387	6,805,586	7,006,133	5,892,522	6,574,302	7,319,177	7,213,899	6,988,365	7,585,585	8,407,862	8,002,197
Florida	2,871,218	2,622,646	2,228,016	2,722,197	2,537,940	2,606,414	2,225,481	2,256,117	1,978,676	2,169,340	2,492,670
Maryland	355,132	352,349	336,262	289,531	325,695	309,286	287,426	218,705	366,736	226,722	300,133
Michigan	505,777	896,414	666,967	551,915	566,417	616,716	462,893	704,517	520,143	513,620	468,037
Minnesota	1,141,135	1,970,797	1,867,015	1,070,918	1,158,353	71,554	1,163,171	610,292	1,851,920	734,669	965,470
New Jersey	257,359	250,261	225,590	216,289	214,178	247,229	262,993	267,535	281,667	228,337	249,918
New York	582,377	710,432	709,818	599,228	640,570	711,582	558,693	477,428	634,453	346,757	551,355
North Carolina	1,405,389	1,649,875	2,104,388	2,386,183	2,306,683	2,617,394	2,846,764	2,682,630	2,953,371	2,984,233	2,174,674
Pennsylvania	693,219	935,110	899,738	602,504	1,048,344	955,754	789,898	576,250	994,615	582,340	696,848
Vermont	121,321	127,318	106,020	94,646	164,857	119,158	118,589	99,803	133,431	112,250	147,264
Washington	942,602	1,054,435	1,071,771	1,135,469	1,375,147	1,574,638	1,199,160	1,260,365	1,685,915	1,291,353	1,503,168
Wisconsin	730,327	1,547,816	1,138,582	703,017	834,380	564,943	667,960	454,852	840,801	456,193	839,302
11 States	16,008,866	18,212,607	17,650,482	15,665,191	17,106,296	17,002,263	17,238,234	16,119,431	19,192,860	17,706,919	17,839,681
						--- Per capita (Dollars) ---					
US	150	176	176	154	178	169	175	140	187	171	159
California	245	233	234	194	213	235	230	222	239	261	245
Florida	233	208	171	205	188	190	159	159	137	148	167
Maryland	76	75	70	60	66	63	58	44	73	45	59
Michigan	55	97	72	59	60	65	48	73	53	52	48
Minnesota	266	454	426	242	259	16	255	133	398	157	204
New Jersey	33	32	29	28	27	31	33	34	35	28	31
New York	32	40	39	33	35	39	31	26	35	19	30
North Carolina	217	251	316	354	338	377	403	373	404	402	288
Pennsylvania	59	79	76	50	88	79	66	48	83	48	58
Vermont	221	228	188	167	289	208	205	171	228	191	249
Washington	203	222	219	226	268	300	225	232	306	230	264
Wisconsin	151	319	232	142	167	112	131	89	163	88	161
11 States	169	189	180	158	170	167	168	156	184	168	168

Source: US Department of Commerce, Bureau of Economic Analysis.

Table D-3. Personal Income Originating with Farm Proprietors for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total (Thous. dollars) ---					
US	17,873,000	21,517,000	22,582,000	12,592,000	19,493,000	14,887,000	7,709,000	21,950,000	21,659,000	23,178,000	28,893,000
California	2,041,707	2,072,163	3,039,435	4,042,699	2,797,123	2,743,491	2,385,829	3,070,297	3,038,943	3,605,962	4,703,702
Florida	756,622	857,499	894,751	1,272,794	1,001,417	1,359,984	2,124,636	1,377,342	1,358,227	1,521,316	1,650,783
Maryland	77,797	137,037	99,370	(12,962)	65,525	65,824	11,555	194,646	207,431	222,041	228,642
Michigan	457,765	391,773	399,737	364,439	330,466	211,010	(717)	313,951	413,342	244,352	376,583
Minnesota	1,342,855	1,460,363	1,061,166	695,818	757,782	556,203	(158,606)	1,140,735	1,004,934	1,314,085	1,780,943
New Jersey	53,763	75,368	62,751	51,647	89,015	96,237	129,563	127,527	156,064	162,165	188,502
New York	131,677	239,328	319,900	289,689	304,066	243,167	98,628	198,446	257,098	381,706	454,347
North Carolina	664,297	931,000	522,486	404,333	819,779	789,222	366,025	1,036,034	900,574	895,821	849,313
Pennsylvania	289,815	351,133	470,858	234,337	449,293	325,369	132,432	588,959	574,808	629,934	601,486
Vermont	47,451	70,849	78,442	79,272	93,553	89,430	52,409	49,451	67,688	68,584	91,177
Washington	390,826	527,851	481,605	601,290	556,059	421,762	754,849	701,679	402,205	739,789	727,975
Wisconsin	1,023,570	969,707	1,210,901	1,210,238	893,607	702,696	128,826	643,494	637,004	943,128	980,430
11 States	7,146,468	7,844,743	8,321,502	8,943,905	7,853,619	7,361,228	5,926,801	9,244,115	8,761,220	10,347,177	12,179,536
						--- Per capita (Dollars) ---					
US	81	97	101	55	85	64	33	93	91	97	119
California	91	91	131	170	115	111	94	119	115	133	169
Florida	85	94	94	129	98	130	198	125	120	130	138
Maryland	19	33	24	-3	15	15	3	45	47	49	50
Michigan	50	43	43	39	36	23	0	35	46	27	41
Minnesota	337	365	263	170	184	135	-38	274	240	312	421
New Jersey	7	10	9	7	12	13	17	17	21	21	25
New York	7	14	18	16	17	14	6	11	14	21	25
North Carolina	117	162	90	69	138	131	60	168	144	142	133
Pennsylvania	24	30	40	20	38	27	11	50	49	53	51
Vermont	96	142	155	155	181	172	100	94	128	128	169
Washington	104	136	120	145	131	99	176	162	91	166	161
Wisconsin	222	209	260	257	189	149	27	136	134	198	205
11 States	87	94	99	104	91	84	67	103	97	112	130

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Table D-3. Personal Income Originating with Farm Proprietors for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total (Thous. dollars) ---					
US	26,569,000	32,605,000	31,303,000	26,608,000	33,270,000	30,540,000	32,099,000	22,322,000	34,244,000	29,570,000	25,724,000
California	4,787,311	4,429,755	4,190,846	3,110,867	3,919,518	4,450,877	4,239,381	3,598,260	3,778,714	4,458,698	3,750,544
Florida	2,204,789	1,921,688	1,420,855	1,956,889	1,810,583	1,778,605	1,413,319	1,399,388	1,144,260	1,273,778	1,564,987
Maryland	278,503	270,762	241,157	197,067	236,682	211,728	191,144	109,459	248,564	104,063	177,433
Michigan	260,173	610,585	303,983	168,385	142,044	190,512	38,263	272,486	60,856	2,298	(80,247)
Minnesota	902,863	1,704,010	1,540,963	740,632	809,389	(286,307)	799,106	234,074	1,445,950	273,640	471,070
New Jersey	171,478	156,526	113,903	104,756	104,071	122,758	137,015	121,117	119,238	55,997	77,647
New York	317,030	425,165	373,935	268,540	319,469	363,234	220,317	101,053	235,789	(56,801)	145,388
North Carolina	1,137,495	1,361,939	1,765,061	2,050,203	1,983,935	2,262,340	2,493,526	2,294,210	2,560,906	2,576,696	1,711,531
Pennsylvania	409,211	629,282	540,003	246,345	703,022	581,015	425,832	169,678	559,175	138,648	253,945
Vermont	90,595	94,285	67,077	56,408	127,920	77,834	77,420	52,797	82,392	59,515	94,300
Washington	555,224	623,761	547,344	607,867	864,127	1,014,742	599,497	558,182	877,295	433,611	584,160
Wisconsin	420,392	1,195,443	699,693	250,451	346,468	75,004	182,098	(33,904)	323,652	(117,539)	225,076
11 States	11,218,034	12,998,036	11,430,885	9,489,870	11,047,759	10,479,108	10,596,601	8,775,747	11,201,002	9,259,405	8,830,446
						--- Per capita (Dollars) ---					
US	109	132	125	106	130	118	123	85	129	110	95
California	168	152	140	102	127	143	135	114	119	138	115
Florida	179	152	109	147	134	130	101	99	79	87	105
Maryland	60	57	50	41	48	43	38	22	49	20	35
Michigan	28	66	33	18	15	20	4	28	6	0	-8
Minnesota	210	393	351	167	181	-63	175	51	311	58	100
New Jersey	22	20	15	13	13	16	17	15	15	7	10
New York	18	24	21	15	18	20	12	6	13	-3	8
North Carolina	176	207	265	304	290	326	353	319	350	347	227
Pennsylvania	35	53	45	21	59	48	35	14	46	12	21
Vermont	165	169	119	99	224	136	134	91	141	101	160
Washington	120	131	112	121	168	193	112	103	159	77	103
Wisconsin	87	246	143	51	69	15	36	-7	63	-23	43
11 States	118	135	116	95	110	103	103	85	107	88	83

Source: US Department of Commerce, Bureau of Economic Analysis.

Table D-4. Personal Income Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total (Thous. dollars) ---					
US	4,410,000	5,141,000	6,001,000	6,193,000	6,718,000	7,273,000	8,142,000	9,393,000	10,479,000	10,856,000	14,304,000
California	983,970	1,135,506	1,360,657	1,482,606	1,634,928	1,727,839	1,893,277	2,158,863	2,376,524	2,472,798	3,134,627
Florida	388,294	434,744	488,847	522,691	567,704	592,372	648,203	733,446	823,238	880,382	1,044,895
Maryland	62,787	75,564	87,545	94,382	103,581	115,140	133,634	161,415	186,252	208,091	282,984
Michigan	116,514	138,234	155,252	154,290	160,036	165,433	179,730	202,503	235,617	261,421	340,603
Minnesota	82,140	100,180	116,101	118,203	126,004	135,362	144,106	164,656	172,849	172,744	243,944
New Jersey	113,368	128,931	140,560	148,069	159,595	180,336	208,257	249,309	287,497	311,866	436,211
New York	211,643	233,566	257,742	261,231	291,072	323,589	360,015	408,405	453,527	486,774	635,762
North Carolina	84,407	105,763	121,511	114,842	122,863	125,245	146,356	180,734	208,153	224,334	347,647
Pennsylvania	160,344	184,126	215,813	216,889	232,314	260,268	287,504	323,675	359,655	390,993	534,093
Vermont	9,217	11,556	13,449	13,626	15,746	16,607	20,014	23,360	22,623	24,531	42,713
Washington	88,143	111,764	130,378	143,590	163,013	168,177	180,703	200,483	208,192	217,476	311,672
Wisconsin	83,554	100,646	119,930	124,107	134,359	144,064	159,923	189,805	195,849	196,861	277,415
11 States	2,172,738	2,527,014	2,950,043	3,133,295	3,420,143	3,630,843	4,001,707	4,588,249	5,076,449	5,361,497	6,996,804
						--- Per capita (Dollars) ---					
US	20	23	27	27	29	31	35	40	44	45	59
California	44	50	59	62	67	70	75	84	90	91	113
Florida	44	48	52	53	56	57	60	66	73	75	87
Maryland	15	18	21	22	24	27	31	37	42	46	62
Michigan	13	15	17	17	17	18	20	22	26	29	37
Minnesota	21	25	29	29	31	33	35	40	41	41	58
New Jersey	15	18	19	20	22	24	28	33	38	41	57
New York	12	13	15	15	17	18	20	23	25	27	36
North Carolina	15	18	21	19	21	21	24	29	33	35	54
Pennsylvania	13	16	18	18	20	22	24	27	31	33	45
Vermont	19	23	27	27	31	32	38	44	43	46	79
Washington	23	29	32	35	38	39	42	46	47	49	69
Wisconsin	18	22	26	26	28	30	34	40	41	41	58
11 States	26	30	35	37	39	41	45	51	56	58	75

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Table D-4. Personal Income Originating in Ag Services for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Total (Thous. dollars) ---					
US	15,464,000	16,177,000	18,305,000	19,539,000	20,854,000	24,064,000	23,253,000	24,368,000	25,463,000	27,957,000	30,780,000
California	3,438,384	3,738,018	4,313,185	4,442,524	4,722,288	5,338,140	5,141,235	5,376,798	5,600,180	6,178,649	6,761,762
Florida	1,170,340	1,247,401	1,389,446	1,543,831	1,636,713	1,857,044	1,841,922	1,895,780	2,040,277	2,194,145	2,392,841
Maryland	311,364	337,169	366,537	368,581	378,373	422,808	434,351	444,083	471,013	503,931	549,268
Michigan	379,215	405,796	450,214	479,193	510,723	569,947	611,798	658,739	718,514	792,614	863,858
Minnesota	247,189	253,213	286,484	301,551	327,798	374,965	348,388	362,090	374,231	404,330	(D)
New Jersey	452,302	469,170	487,397	489,246	513,984	610,078	607,200	631,192	677,909	735,709	792,776
New York	684,261	712,178	777,683	804,706	814,601	906,372	863,485	903,015	941,758	1,011,780	1,105,587
North Carolina	352,485	356,832	404,753	427,557	447,658	532,563	515,187	578,053	669,960	766,978	864,942
Pennsylvania	581,008	619,653	710,922	765,756	804,748	927,653	858,471	877,922	900,826	964,040	1,062,544
Vermont	44,704	44,216	49,343	51,838	53,200	59,882	55,329	57,888	59,463	63,239	71,469
Washington	322,786	348,713	428,389	472,725	506,773	588,675	574,674	591,101	593,316	669,052	732,862
Wisconsin	282,255	292,509	338,192	365,923	393,917	451,574	420,941	432,415	442,109	469,803	518,947
11 States	7,582,032	8,112,690	9,224,862	9,708,725	10,296,175	11,733,329	11,409,496	11,906,061	12,547,798	13,742,490	(D)
						--- Per capita (Dollars) ---					
US	63	66	73	77	82	93	89	93	96	104	114
California	121	128	144	146	153	171	164	171	176	192	207
Florida	95	99	107	116	121	135	132	134	141	149	161
Maryland	67	71	76	76	77	86	87	88	93	99	107
Michigan	41	44	48	51	54	60	64	68	74	81	88
Minnesota	58	58	65	68	73	83	76	79	81	86	(D)
New Jersey	59	61	63	63	66	77	77	79	85	91	98
New York	38	40	43	45	45	50	48	50	52	56	61
North Carolina	54	54	61	63	66	77	73	80	92	103	115
Pennsylvania	49	52	60	64	67	77	71	73	75	80	89
Vermont	81	79	87	91	93	104	96	99	101	107	121
Washington	70	73	87	94	99	112	108	109	108	119	129
Wisconsin	59	60	69	74	79	89	83	84	85	90	99
11 States	80	84	94	98	102	116	111	115	120	130	(D)

(D) = Not disclosed.
Source: US Department of Commerce, Bureau of Economic Analysis.

Table D-5. Personal Income Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
						--- Total (Thous. dollars) ---					
US	24,137,000	26,300,000	28,820,000	31,161,000	33,405,000	35,105,000	35,749,000	37,008,000	38,212,000	39,835,000	41,650,000
California	2,787,979	3,041,154	3,384,466	3,709,440	4,012,428	4,238,949	4,281,127	4,445,380	4,500,432	4,644,456	4,878,355
Florida	634,763	697,507	739,466	817,768	870,800	940,160	984,189	1,028,646	1,065,989	1,121,302	1,151,772
Maryland	381,242	404,462	425,239	428,879	451,787	474,616	506,704	553,321	587,728	623,476	641,267
Michigan	835,852	904,609	985,846	1,026,182	1,078,868	1,108,548	1,141,116	1,178,880	1,210,672	1,232,472	1,287,533
Minnesota	753,572	820,446	902,495	947,343	1,013,824	1,084,816	1,118,840	1,137,071	1,153,195	1,223,598	1,293,711
New Jersey	822,265	883,491	968,043	1,072,626	1,145,628	1,200,002	1,312,065	1,374,262	1,465,943	1,578,991	1,641,777
New York	1,544,581	1,656,765	1,773,996	1,879,237	2,020,299	2,080,171	2,147,991	2,274,065	2,369,569	2,381,193	2,439,381
North Carolina	440,951	500,988	573,767	650,840	700,346	730,984	790,859	819,833	877,276	940,658	1,042,110
Pennsylvania	1,374,394	1,484,284	1,606,418	1,713,829	1,823,861	1,906,298	1,941,572	2,020,476	2,109,841	2,180,124	2,305,056
Vermont	27,423	29,936	32,166	33,487	36,718	39,370	40,854	45,178	49,349	58,183	64,866
Washington	460,433	511,700	563,487	591,718	648,320	679,442	682,417	684,373	705,139	716,899	751,611
Wisconsin	956,467	1,035,193	1,124,991	1,238,750	1,334,122	1,380,305	1,393,810	1,411,919	1,416,217	1,488,464	1,565,935
11 States	9,475,341	10,313,770	11,306,384	12,230,862	13,116,702	13,783,490	14,193,553	14,699,339	15,141,781	15,808,623	16,623,993
						--- Per capita (Dollars) ---					
US	110	118	128	137	146	152	153	157	161	166	172
California	125	133	146	156	165	171	169	172	170	171	176
Florida	71	76	78	83	85	90	92	93	94	96	96
Maryland	91	96	101	101	106	111	117	127	133	139	140
Michigan	91	98	107	111	117	122	126	130	133	135	140
Minnesota	189	205	223	232	247	263	270	273	276	291	305
New Jersey	112	120	131	145	155	161	176	183	194	207	214
New York	87	93	101	107	115	118	121	128	133	134	137
North Carolina	78	87	99	110	118	121	130	133	140	149	163
Pennsylvania	116	125	135	144	154	161	164	171	179	185	195
Vermont	56	60	64	65	71	76	78	86	93	109	120
Washington	122	132	140	142	153	159	159	158	160	161	166
Wisconsin	207	223	241	263	282	292	295	298	298	313	328
11 States	115	124	134	143	151	157	160	164	167	172	178

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Table D-5. Personal Income Originating in Food Manufacturing for New York, 11 Competitor States and the US, 1977-98 (continued)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
						--- Total (Thous. dollars) ---					
US	43,460,000	44,976,000	47,313,000	49,888,000	52,486,000	53,850,000	55,411,000	55,449,000	57,313,000	59,724,000	62,155,000
California	5,017,785	5,308,391	5,741,173	6,081,621	6,326,485	6,354,659	6,404,925	6,098,316	6,413,793	6,722,365	7,011,650
Florida	1,224,605	1,299,661	1,369,536	1,394,015	1,422,176	1,466,685	1,483,909	1,429,903	1,465,049	1,495,115	1,553,712
Maryland	653,117	682,691	736,398	735,622	738,997	742,951	742,267	728,379	742,194	777,221	808,317
Michigan	1,358,571	1,403,142	1,433,595	1,518,369	1,641,650	1,637,606	1,711,332	1,666,856	1,687,358	1,681,763	1,695,131
Minnesota	1,363,907	1,502,139	1,569,303	1,674,808	1,824,096	1,799,319	1,881,532	1,952,935	2,122,706	2,152,135	2,191,103
New Jersey	1,728,583	1,794,416	1,755,296	1,784,717	1,877,825	1,943,166	1,951,241	1,927,594	1,980,366	2,009,849	2,041,189
New York	2,526,174	2,553,188	2,562,543	2,627,187	2,696,873	2,685,302	2,716,697	2,613,842	2,686,958	2,727,946	2,792,844
North Carolina	1,121,880	1,140,652	1,182,388	1,230,242	1,263,979	1,322,448	1,398,721	1,446,502	1,486,200	1,518,451	1,592,684
Pennsylvania	2,425,073	2,555,480	2,615,200	2,748,232	2,877,021	2,994,126	3,043,297	2,999,422	3,077,900	3,171,620	3,276,954
Vermont	72,150	79,254	90,024	97,489	105,935	113,751	120,357	125,954	132,343	132,989	136,773
Washington	796,668	897,446	1,003,773	1,066,842	1,117,201	1,201,249	1,283,597	1,341,193	1,360,778	1,414,185	1,392,173
Wisconsin	1,665,367	1,715,131	1,836,108	1,933,561	2,040,785	2,088,143	2,168,206	2,183,376	2,275,102	2,321,901	2,395,524
11 States	17,427,706	18,378,403	19,332,794	20,265,518	21,236,150	21,664,103	22,189,384	21,900,430	22,743,789	23,397,594	24,095,210
						--- Per capita (Dollars) ---					
US	178	182	190	198	206	209	213	211	216	223	230
California	176	182	192	200	205	204	205	194	202	209	215
Florida	100	103	105	105	105	107	106	101	102	102	104
Maryland	140	144	153	151	151	150	149	145	147	153	158
Michigan	147	152	154	162	173	172	179	173	173	172	173
Minnesota	317	346	358	378	408	398	412	424	457	459	464
New Jersey	224	232	226	229	240	247	246	242	247	250	252
New York	141	142	142	146	149	148	150	144	148	150	154
North Carolina	173	174	178	182	185	190	198	201	203	204	211
Pennsylvania	205	215	220	230	240	249	253	249	256	264	273
Vermont	131	142	159	172	186	198	208	216	226	226	232
Washington	172	189	205	213	217	229	241	247	247	252	245
Wisconsin	345	353	375	390	408	413	426	425	440	446	459
11 States	183	190	197	204	211	213	217	212	218	222	226

Source: US Department of Commerce, Bureau of Economic Analysis.

APPENDIX E

Value Added Data

Table E-1. Value Added to the U.S. Economy by the New York Agricultural Sector Via the Production of Goods and Services, 1990-1999

Item 1/	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
					--- Thousand dollars ---					
Final crop output	961,232	1,009,113	905,392	891,245	984,417	943,614	952,734	1,018,987	1,031,721	1,068,447
Food grains	17,708	15,307	17,981	12,894	18,977	26,826	29,603	24,339	17,954	18,947
Feed crops	144,969	152,069	147,382	144,895	154,924	162,599	194,524	172,234	173,022	151,081
Cotton	0	0	0	0	0	0	0	0	0	0
Oil crops	7,508	8,010	8,123	15,134	18,444	15,195	26,248	16,151	22,622	23,246
Tobacco	0	0	0	0	0	0	0	0	0	0
Fruits and tree nuts	178,197	209,457	193,799	168,956	177,369	192,174	210,872	203,110	191,089	208,961
Vegetables	338,393	402,347	243,842	338,488	321,015	332,126	248,636	313,633	355,966	351,566
All other crops	256,827	239,694	305,940	252,167	240,808	241,400	231,612	271,057	294,015	300,410
Home consumption	2,628	2,594	2,628	2,663	2,628	2,594	2,628	2,628	2,628	2,697
Value of inventory adjustment 2/	15,002	(20,365)	(14,303)	(43,952)	50,252	(29,300)	8,611	15,835	(25,575)	11,539
Final animal output	1,997,341	1,814,451	1,916,379	1,916,371	1,885,582	1,908,761	2,102,271	1,788,850	2,077,728	2,046,309
Meat animals	195,714	208,050	209,179	249,014	223,772	160,853	112,698	125,245	118,818	131,244
Dairy products	1,590,542	1,399,140	1,527,273	1,463,554	1,495,702	1,487,696	1,690,419	1,526,158	1,786,862	1,736,962
Poultry and eggs	101,462	94,236	82,280	90,799	89,844	91,601	101,213	86,704	91,654	86,473
Miscellaneous livestock	94,192	96,540	89,567	122,328	104,395	142,159	173,576	89,984	94,415	88,527
Home consumption	9,341	8,870	8,812	7,873	6,280	4,465	3,344	4,102	3,448	3,390
Value of inventory adjustment 2/	6,090	7,615	(732)	(17,197)	(34,411)	21,987	21,021	(43,343)	(17,469)	(287)
Services and forestry	208,703	211,691	232,618	250,544	271,243	269,569	242,931	273,558	278,467	315,312
Machine hire and customwork	19,600	18,653	20,890	19,432	21,783	23,701	24,464	36,221	27,384	16,817
Forest products sold	19,370	17,440	7,630	9,190	9,450	8,980	9,160	9,618	10,099	10,125
Other farm income	44,583	46,634	66,390	66,646	67,865	70,922	51,540	73,543	80,203	130,870
Gross imputed rental value of farm dwellings	125,150	128,964	137,708	155,276	172,145	165,966	157,767	154,176	160,781	157,500
Final agricultural sector output	3,167,276	3,035,255	3,054,389	3,058,160	3,141,242	3,121,943	3,297,936	3,081,395	3,387,916	3,430,068
less: Intermediate consumption outlays	1,502,825	1,486,950	1,455,823	1,455,964	1,578,813	1,664,429	1,603,834	1,763,016	1,827,395	1,777,047

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Table E-1. Value Added to the U.S. Economy by the New York Agricultural Sector Via the Production of Goods and Services, 1990-1999 (continued)

Item 1/	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
					--- Thousand dollars ---					
Farm origin	541,356	539,629	531,570	516,204	497,740	541,003	539,472	617,632	654,279	602,474
Feed purchased	445,787	437,202	438,109	424,648	401,231	431,385	418,119	484,335	511,010	475,043
Livestock and poultry purchased	17,952	15,186	21,906	19,928	14,920	15,107	12,449	13,918	13,899	18,555
Seed purchased	77,617	87,241	71,555	71,628	81,589	94,511	108,904	119,379	129,370	108,876
Manufactured inputs	349,676	357,994	334,359	318,304	349,824	386,814	366,963	405,922	371,718	363,157
Fertilizers and lime	113,774	119,960	106,072	90,304	106,902	118,863	105,394	113,375	108,440	102,616
Pesticides	63,532	71,635	68,977	64,378	77,700	89,736	78,984	88,475	91,329	82,766
Petroleum fuel and oils	103,533	100,387	92,356	93,785	92,759	101,282	109,716	111,276	99,156	98,480
Electricity	68,837	66,012	66,954	69,837	72,463	76,933	72,869	92,796	72,793	79,295
Other intermediat expenses	611,793	589,327	589,894	621,456	731,249	736,612	697,399	739,462	801,398	811,416
Repair and maintenance of capital items	177,919	176,153	184,701	180,235	192,048	181,789	178,674	198,008	221,672	204,796
Machine hire and customwork	30,615	32,086	27,768	33,789	45,549	60,614	44,689	49,087	65,012	61,452
Marketing, storage, and transportation expenses	150,689	129,251	93,625	114,207	149,814	150,079	130,858	140,107	116,695	130,307
Contract labor	9,482	6,187	6,824	7,031	9,202	7,491	10,849	14,655	18,040	20,976
Miscellaneous expenses	243,088	245,650	276,976	286,194	334,636	336,639	332,329	337,605	379,979	393,885
plus: Net government transactions	(126,456)	(149,628)	(146,973)	(124,531)	(165,246)	(162,950)	(165,569)	(176,750)	(162,289)	(121,943)
+ Direct Government payments	59,304	41,242	47,872	72,286	42,417	43,481	43,401	39,623	59,659	117,168
- Motor vehicle registration and licensing fees	5,881	5,496	5,079	3,992	6,588	6,989	5,981	5,469	6,745	5,648
- Property taxes	179,879	185,374	189,766	192,825	201,075	199,442	202,989	210,904	215,203	233,463
Gross value added	1,537,995	1,398,677	1,451,593	1,477,665	1,397,183	1,294,564	1,528,533	1,141,629	1,398,232	1,531,078
less: Capital consumption	410,425	415,445	420,508	413,507	405,978	406,429	401,755	397,458	398,593	403,882
Net value added	1,127,570	983,232	1,031,085	1,064,158	991,205	888,135	1,126,778	744,171	999,639	1,127,196

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Table E-1. Value Added to the U.S. Economy by the New York Agricultural Sector Via the Production of Goods and Services, 1990-1999 (continued)

Item 1/	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					--- Thousand dollars ---					
less: Factor payments	517,119	485,775	478,592	465,045	501,579	528,689	556,103	567,946	577,562	540,660
Employee compensation (total hired labor)	329,640	323,855	327,516	340,922	342,657	370,955	382,575	392,879	409,569	367,638
Net rent received by nonoperator landlords	(9,295)	(5,214)	(4,957)	(9,403)	(11,264)	(9,822)	(6,679)	(1,923)	(14,298)	(11,831)
Real estate and nonreal estate interest	196,774	167,134	156,033	133,526	170,186	167,556	180,207	176,990	182,291	184,853
Net farm income	610,451	497,457	552,493	599,113	489,626	359,446	570,675	176,225	422,077	586,536

Source: Economic Research Service/USDA.

Table E-2. Value Added per Employee, Farming, 1977-1998

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	--- Current dollars ---										
US	12,239	14,575	17,123	14,773	18,639	17,813	12,668	18,679	19,359	18,878	19,870
California	16,294	19,753	23,719	25,745	26,545	27,141	20,559	28,056	30,154	31,750	35,535
Florida	15,594	19,436	21,076	20,965	23,132	25,730	23,458	26,964	31,271	31,919	35,058
Maryland	8,837	11,727	12,186	9,188	12,814	13,942	10,778	16,690	19,548	19,467	20,266
Michigan	11,381	12,639	14,300	14,393	15,958	15,317	11,446	14,883	16,446	14,342	14,525
Minnesota	18,022	19,672	21,497	20,327	24,274	22,293	13,883	24,570	21,899	21,853	22,313
New Jersey	10,242	12,584	13,059	12,187	15,056	16,083	14,133	16,738	20,300	19,984	21,596
New York	9,689	11,754	13,890	13,545	15,823	15,748	12,128	14,525	16,080	16,983	17,880
North Carolina	7,672	10,803	9,260	9,554	12,440	13,179	9,283	14,454	15,050	16,146	18,638
Pennsylvania	9,520	11,936	14,581	11,454	15,434	14,961	11,841	16,796	17,189	17,715	17,440
Vermont	9,102	11,127	12,775	11,860	14,048	15,148	11,824	13,026	17,414	17,537	19,927
Washington	12,741	16,521	16,545	16,716	18,841	17,588	16,641	20,416	19,006	21,478	22,708
Wisconsin	12,911	14,198	16,967	17,600	19,343	19,032	13,755	18,207	19,521	21,229	21,236
11 States	13,254	15,929	17,815	17,931	20,097	20,204	15,470	21,254	22,336	23,235	25,027

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	--- Current dollars ---										
US	19,446	23,822	25,238	23,582	26,323	23,504	27,097	23,563	30,001	28,531	25,635
California	32,465	34,414	39,456	33,241	39,464	37,905	42,485	36,417	40,349	46,207	34,290
Florida	33,897	37,981	35,025	37,668	36,700	33,292	32,294	31,316	38,294	35,692	37,757
Maryland	22,346	26,758	27,385	23,993	25,893	25,730	28,577	23,901	32,735	25,817	30,059
Michigan	14,056	19,896	18,339	17,186	17,310	17,260	16,568	17,645	18,597	18,972	17,962
Minnesota	17,701	28,181	28,661	23,274	23,926	13,409	25,219	21,393	35,763	26,577	26,702
New Jersey	20,642	24,105	24,252	22,292	22,201	24,589	27,078	24,412	27,221	22,609	25,346
New York	16,987	21,009	21,217	19,327	19,976	19,730	19,712	18,246	21,741	18,060	20,921
North Carolina	20,576	25,709	30,363	31,142	32,396	34,619	40,539	36,493	45,871	45,095	38,211
Pennsylvania	16,083	21,033	21,342	17,418	22,271	20,288	20,289	16,971	22,179	17,569	19,393
Vermont	19,719	22,746	21,212	19,649	25,432	20,692	22,086	19,644	23,828	22,345	24,512
Washington	19,912	24,684	25,381	26,559	35,450	34,885	32,420	30,860	36,392	31,906	31,896
Wisconsin	17,364	25,768	24,054	20,808	21,511	18,725	21,833	19,183	25,586	22,235	25,096
11 States	23,311	28,630	29,874	27,128	30,163	28,126	31,318	28,135	34,464	33,409	30,357

Source: US Department of Commerce, Bureau of Economic Analysis.

Table E-3. Value Added per Employee, Ag Services, 1977-1998

	1977	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						--- Current dollars ---					
US	11,531	12,453	13,701	13,815	14,089	14,750	15,599	16,341	17,673	18,893	20,690
California	9,668	10,271	10,966	11,183	11,947	12,580	12,697	13,954	14,088	15,067	20,272
Florida	9,030	9,252	10,172	10,329	10,795	11,012	11,305	12,152	13,157	14,621	17,113
Maryland	14,077	14,200	14,991	15,676	15,613	15,563	17,882	17,943	21,316	23,183	22,362
Michigan	12,130	12,732	13,861	13,970	14,404	15,765	15,484	16,789	16,601	18,382	18,887
Minnesota	12,019	12,701	14,431	13,813	14,505	15,971	16,297	18,121	16,851	18,079	20,816
New Jersey	11,905	12,249	12,994	13,254	13,289	13,936	15,294	16,263	18,787	20,222	26,020
New York	11,236	11,634	12,305	12,308	12,764	13,523	14,061	15,378	16,093	17,526	23,015
North Carolina	10,498	11,623	13,539	13,923	13,877	13,797	15,529	15,844	17,509	17,782	20,141
Pennsylvania	11,322	12,033	13,028	12,922	13,536	14,844	15,124	16,802	16,719	17,684	20,699
Vermont	10,722	11,091	11,858	11,858	13,021	14,826	15,647	17,437	15,990	17,529	21,059
Washington	25,433	30,002	32,419	30,443	27,122	24,909	28,917	26,204	35,472	42,165	40,507
Wisconsin	12,360	13,275	14,905	15,377	16,176	18,289	18,779	20,157	19,746	20,497	22,115
11 States	10,793	11,559	12,534	12,662	13,103	13,622	14,174	15,138	16,065	17,482	21,133

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*
						--- Current dollars ---					
US	21,168	21,215	22,087	21,880	23,084	23,582	22,206	22,385	22,056	23,079	24,023
California	18,990	19,567	21,100	21,227	22,380	22,666	21,120	21,100	20,596	22,309	23,396
Florida	17,463	17,811	18,557	18,701	19,626	20,020	19,661	19,143	19,251	19,705	20,489
Maryland	24,194	23,371	22,834	21,485	22,619	23,270	23,315	23,206	23,661	24,498	25,688
Michigan	19,235	19,616	19,683	19,575	20,852	21,000	21,229	21,698	22,423	23,484	24,584
Minnesota	20,634	20,935	21,967	21,046	22,889	23,700	21,608	21,236	20,958	21,747	23,485
New Jersey	26,588	26,541	27,323	27,358	27,535	29,599	29,432	28,869	29,301	30,282	31,606
New York	22,841	23,294	23,800	23,351	23,375	23,630	23,426	24,485	24,386	25,304	26,321
North Carolina	20,269	19,427	19,122	18,543	19,668	19,973	19,267	19,385	20,295	21,256	22,406
Pennsylvania	20,479	21,448	22,505	23,121	25,048	25,979	24,030	23,712	23,261	24,096	25,164
Vermont	19,176	19,782	19,513	19,221	19,787	18,338	17,260	18,182	18,070	18,347	19,356
Washington	48,211	47,290	50,249	47,623	45,443	43,187	40,698	43,440	40,341	41,436	40,878
Wisconsin	21,643	22,361	23,016	22,952	24,416	25,567	23,793	23,141	22,812	23,318	24,275
11 States	21,025	21,343	22,510	22,380	23,354	23,680	22,516	22,449	22,109	23,307	24,292

Source: US Department of Commerce, Bureau of Economic Analysis.

Table E-4. Value Added per Employee, Food Manufacturing, 1977-1998

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	--- Current dollars ---										
US	24,677	25,360	26,451	30,589	33,627	38,371	41,400	42,557	44,628	47,030	48,443
California	27,565	28,010	28,727	33,050	35,983	41,419	44,957	45,452	48,021	54,259	57,744
Florida	24,637	26,733	28,718	33,788	36,113	41,717	46,799	48,052	49,857	54,031	56,758
Maryland	27,917	28,099	29,327	34,619	38,140	41,685	48,532	46,211	49,425	53,452	57,064
Michigan	29,473	30,313	31,536	36,562	40,057	43,610	48,300	50,437	54,239	58,179	59,192
Minnesota	20,156	20,662	22,411	26,052	29,406	35,170	39,291	37,039	39,291	40,279	45,092
New Jersey	29,364	31,816	33,825	39,452	43,629	51,104	55,427	54,484	59,012	57,849	63,527
New York	31,991	30,355	31,932	36,665	40,927	47,395	50,977	50,904	54,476	56,896	57,959
North Carolina	16,800	18,301	19,774	22,975	25,519	28,784	33,387	34,625	37,215	38,724	33,316
Pennsylvania	23,198	24,026	25,082	29,260	32,335	37,212	40,368	40,410	44,581	44,600	47,655
Vermont	13,274	10,526	12,124	14,616	17,451	21,328	24,003	27,245	36,269	29,314	24,491
Washington	24,687	25,334	26,074	29,218	31,457	34,156	39,775	39,238	40,164	41,954	41,947
Wisconsin	26,545	26,673	27,738	31,824	34,534	38,403	42,971	43,978	46,087	47,336	48,434
11 States	25,436	26,272	27,453	31,761	34,766	39,620	43,818	44,077	46,967	49,697	51,894

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	--- Current dollars ---										
US	51,427	53,822	57,472	61,588	63,381	63,663	64,967	71,121	69,252	69,725	71,225
California	56,470	59,942	65,323	69,783	71,540	69,817	69,479	75,791	73,648	73,873	74,009
Florida	60,401	59,691	67,219	67,950	72,690	82,448	77,302	72,852	81,420	78,101	81,062
Maryland	59,464	70,249	75,470	75,454	68,951	69,854	67,743	73,554	84,222	83,706	83,208
Michigan	69,094	70,736	76,191	78,919	84,080	78,170	86,201	87,651	73,400	74,546	76,266
Minnesota	46,106	51,618	50,405	51,482	57,461	58,344	59,310	61,289	60,548	60,552	61,500
New Jersey	68,871	69,159	75,237	80,061	78,460	80,548	80,796	85,077	80,988	80,818	81,447
New York	64,480	70,487	70,809	81,087	85,521	89,480	86,527	85,525	91,382	94,508	92,926
North Carolina	35,905	40,261	41,363	43,427	44,675	49,416	54,147	57,480	52,553	52,498	53,908
Pennsylvania	47,858	51,118	52,803	54,905	58,822	58,743	60,366	68,134	65,627	66,171	67,223
Vermont	26,512	32,908	41,030	39,726	40,225	41,359	35,529	48,263	45,985	48,151	48,593
Washington	46,150	44,463	41,147	44,110	51,490	53,521	58,000	59,888	60,307	60,146	60,167
Wisconsin	54,379	51,250	51,816	57,644	65,868	63,867	61,874	65,642	65,068	64,440	65,089
11 States	54,110	56,426	59,605	62,666	65,866	66,059	66,715	70,741	68,864	68,810	69,658

Source: US Department of Commerce, Bureau of Economic Analysis.

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